

### THE LAND AND BUILDINGS, EPPING FOREST, AND THE NEW SCHEME.

SOME interesting statements have been made before the Commissioners now sitting for the purpose of hearing objections and suggestions respecting the scheme for the preservation and future management of Epping Forest.

Amongst those who have appeared in opposition were the British Land Company, on behalf of whom it was stated that the company were large holders of land within the boundary of the forest and the neighbourhood, and had within the last twenty years bought and laid out for building, and otherwise improved, a large quantity of land in the locality, considerable portions of which were affected by the proposed scheme of the commissioners. It was urged on behalf of the company that in common with all the owners of the land which it was proposed to charge with a rent-charge, they had purchased such lands in total ignorance of the right of intercommunion, and that it would be most inequitable that the owners of inclosed land having, as they thought, extinguished all rights of common, and having given full market value for such land, should now be made to pay a yearly rent-charge.

Mr. Robin Allen entered into a long defence of his rights as a grantee, in opposition to the scheme of the commissioners. He pleaded that so far back as 1855, "being daily engaged in London, in employment involving a good deal of brain work and responsibility, he availed himself of the opening of the railway to purchase three very small contiguous plots of land at Loughton, and by enlargement of a labourer's cottage made a home for himself and family." He afterwards obtained a grant of  $7\frac{1}{2}$  acres, and that "the machinery by which he obtained it seemed to him to be well established and unquestioned, consisting of a survey by a professional man, a petition to the Lord of the Manor, a conveyance as copyhold at a customary court, by 'seisin of the rod with consent and in the presence of the homage representing the manorial commoners,' and by payments of admissions, fines, and fees, and annual quit-rents, representing, as he believed, full value." He contended that it was unjust to impose "an agricultural value in favour of a recreator on land over which he had no legal right," and that "irresponsible officials and landscape gardeners with large ideas ought not to be allowed to injure the privacy or cause the demolition of certain well-established homesteads."

Mr. Henry Hill, another grantee, in opposition to the scheme, urged that it was "merely high-flown sentiment to state that the public had a right to roam about the forest."

Mr. Tindal Atkinson, barrister, on behalf of the Epping Forest Fund Committee, was satisfied with the general provisions of the scheme, but suggested that the members for Hackney and the Tower Hamlets for the time being should be members of the committee of conservators of the forest. Under the provisions of three of the clauses of the scheme, there were 760 acres of enclosed lands to be dealt with. The price of enclosed land near London was from 500*l.* to 600*l.* per acre, and he urged that the conservators of the City of London ought not to be left to deal with a question involving such an enormous aggregate expenditure. The Commissioners ought to decide whether they could make the purchase of the land so inclosed compulsory or not. He suggested that for the purpose of dealing with the matter the 760 acres should be divided into two classes, namely, the land that was built upon, and the land that was not built upon; because, in the first instance, Parliament would never sanction the pulling down of the houses which had been erected thereon, for the purpose of making it common land again. The proceedings of the Commission would greatly enhance the value of the land already inclosed, and the scheme, as it stood, would (in case compulsory powers of purchase were exercised) provide for giving the occupiers compensation on that enhanced value of land, and to which land they had not the slightest legal right. The Forest Fund Committee also objected to the provisions in the scheme allowing sites for the building of new churches, chapels, or charitable buildings, and they hoped those provisions would be omitted. In the case of existing institutions they saw no objection to a portion of the forest being granted in the manner proposed for their protection, but should new sites be allowed there would be no end to the number of claims upon the Conservators.

### A LECTURE-HALL FOR HACKNEY.

ON the 14th inst. the new lecture-hall which has been built in Gore-road for the district parish of Christ Church, South Hackney, was opened. The building has two frontages, one towards North-street, in which is the entrance, and the other towards Gore-road, facing the west end of the church. The hall is 61 ft. long, 31 ft. wide, 14 ft. 6 in. high to the plate, 30 ft. high to the ridge. The roof is of open timber, with plastering between the principals.

The walls are faced with picked stocks, with dressings of Bath stone. The front towards Gore-road has four two-light transomed windows, with gables; the entrance-front has three lofty two-light windows, with arches and carved finials of late fifteenth-century Gothic character. Mr. Forrest, of Victoria Park-square, was the builder. The cost of the building has been about 800*l.* The architects were Messrs. Henry Jarvis & Son.

### BIRMINGHAM BUILDERS' ASSOCIATION.

THE thirteenth annual meeting of the above Association was held on the 14th inst. Mr. J. Webb, in the absence of the president, occupying the chair.

The committee's report and balance-sheet, which had been previously distributed among the members, were taken as read, and, being approved, were ordered to be entered upon the minutes.

The Chairman announced that no notices for alterations in the working rules had been received from any branch of the trade.

After the transaction of the ordinary routine business, Mr. W. B. Briggs was unanimously elected president for the ensuing year, and Mr. E. Davis, vice-president. Mr. J. Webb was elected treasurer in the place of the late Mr. J. Hardwick.

The following gentlemen were appointed a committee for the ensuing year:—Messrs. J. Horsley, Parton, T. Surman, Garlick, Bloore, Cresswell, Brooks, Moffat, Lidzey, W. T. Bennett, W. R. Wilson, C. Jones, jun., Jeffery, Barker, Sapcote, and Collett.

The remaining business was of a private nature. The annual dinner of the members of the Association took place in the evening, when Mr. W. B. Briggs presided, and Mr. Parton and Mr. Moffat occupied the vice-chairs. Amongst those present were representatives of most of the principal local firms, including Messrs. W. & J. Webb, Horsley Brothers, Jeffery & Pritchard, Surman & Son, W. J. Whitterel, Barker & Son, W. Matthews, W. T. Bennett, Jones & Son, W. Brooks, Ravenscroft, Cresswell, &c.

### AUCTIONEERS' CHARGES.

AT the Kingston County Court, Mr. Henry Abrahams, an auctioneer, sued Mr. William Buckwell, late owner of the Lamb Brewery, Surbiton, for 21*l.* 10*s.*, commission for services rendered in endeavouring to dispose of his business.

From the statement of counsel it appeared that in December, 1874, the defendant called upon the plaintiff and said that he wished to dispose of his business. The plaintiff informed Mr. Buckwell that his terms were 5 per cent. on the first 100*l.* and 2½ per cent. on the balance, including all expenses. Mr. Abrahams visited the property, and valued it at 750*l.*, including goodwill and rolling-stock, but the defendant refused to take less than 800*l.* The plaintiff advertised the property, and received many offers, but could not get more than 700*l.* Early in this year the defendant disposed of the business privately, without informing Mr. Abrahams, and refused to pay him any commission. 5*s.* had, however, been paid into Court by the defendant, and by that counsel submitted that the liability had been admitted.

Mr. Abrahams and Mr. Long, also an auctioneer, gave evidence as to the custom of the trade for auctioneers to be paid their commission, once properties were placed in their hands, whether they disposed of them or not, unless they were taken off their books.

Mr. Leone, an auctioneer, was called to disprove the custom alleged by the plaintiff. If an auctioneer did not sell a business he had no claim beyond out-of-pocket expenses.

The Judge gave a verdict for 14*l.* 10*s.* commission on the amount for which it appeared the business had been sold.

### DISPUTE AS TO MARBLE POLISHING.

KELLY V. RADEJAR.

THE plaintiff in this case (heard in the Shore-ditch County Court, on the 7th inst., before Mr. J. P. Dament, judge) is a marble polisher, and he sued the defendant to recover money for work done by him at the Marble Universal Company's Works. The defendant was an overseer at the factory in question, and the summons was an adjourned one. At the first inquiry the defendant failed to appear.

The case for the plaintiff was that he was engaged to work at polishing marble, at the price of 7*d.* an hour, and he worked for thirty-three hours.

The defendant's reply was that the plaintiff was only taken on trial, and it was agreed that he should be paid for his services the sum only of 4*d.* per hour. Some cornice-work, 5 ft. 6 in. long, was spoilt by the unsatisfactory manner in which he went about his work, and he was accordingly dismissed. The defendant also produced a book, showing that good work of the class had been and was performed at even less than 4*d.* an hour.

The plaintiff, an old man, who declared that he had not sufficient time to dry the cornices mentioned, said that he

had been employed in the business of marble polishing for fifty years, and that he gave no cause for dissatisfaction.

In answer to the judge, the plaintiff said that he could neither fix the amount he claimed, nor could he tell the date upon which he performed the thirty-three hours' work.

Having no witnesses to call, the judge nonsuited the plaintiff.

### SCOTTISH CATHEDRALS.

SIR,—Your account of the repairs lately effected in the Abbey Church (not cathedral) of Iona induces me to beg you to grant me a few lines' space for the purpose of correcting a misstatement, so often made that it has now almost become one of the rooted fallacies of popular literature. I have seen it asserted, I believe, a hundred times in print, that the cathedral of Glasgow is the only one in Scotland which has survived the destruction of the Reformation. The statement, however, is quite untrue. There were twelve Scottish Episcopal sees in pre-Reformation times,—St. Andrew's, Glasgow, Whithorn, Dunblane, Dunkeld, Brechin, Aberdeen, Lismore or Argyll, Ross, Caithness, Orkney, and Elgin or Moray. The cathedrals of Aberdeen and Dornoch (Caithness),—poor enough specimens, it is true, yet not inferior to those of Wales,—were as little injured by the Reformers as that of Glasgow. The same is true of Kirkwall, which, as a specimen of the Romanesque style, ranks with Romsey and Wimborne,minster. Brechin, Dunkeld, and Dunblane were only partially overthrown, all three being still used for public worship. Some of the remainder were too small to be very important, yet one of these, Fortrose, which I have not myself seen, is extolled in its highest terms for its beauties by an English ecclesiologist, the late Mr. Neale. The principal losses were St. Andrew's and Elgin. That of the latter is particularly deplorable, as it is believed to have remained comparatively perfect until 1707, the year of the Union, when the towers fell and broke through the roof, a fact which, if correctly reported, may seem to indicate an original defect of construction.

The last writer, I think, who has made the above statement is a contributor to the *Frankfurter Zeitung*, who is now publishing his notes of a tour in Britain. Judging from some of his statements, he must be a remarkable specimen of that *rara avis*, the intelligent foreigner. He likens Glasgow Cathedral to the old synagogue of Prague,—a building smaller than the smallest church (whichever that may be) in London or Glasgow, the curiosity of which consists in its dating, or being said to date, from the eighth century. He might just as well compare Westminster Abbey with Bonchurch or St. Lawrence, in the Isle of Wight. He does not seem sufficiently well acquainted with the monumental edifices of his own country to know that there is one of them which strikingly resembles Glasgow cathedral, in the style of its exterior at least,—I mean that of Magdeburg. The interiors, however, differ widely; the latter being all First Pointed of the earliest type, whilst Glasgow is one of the best specimens of the Second Pointed and Decorated which can be found within the four seas of Britain. Magdeburg is equally fine in its own style, and is now seen to great advantage, since its restoration by the late King of Prussia. I have often regretted that it should be unknown, or almost unknown, to English antiquaries and architects.

From what I have written, it appears that four of the old Scottish cathedrals remain much as they were, whilst three others are not very far from perfect.

VITRUVIUS MINOR.

### CHALK.

SOME cottages of chalk and flint, in panels, were lately destroyed at West Croydon. They appeared about 100 years old. The chalk was built in blocks of about 20 in. by 14 in., and the thickness of the wall. They were laid on their natural bed, and still bore the marks of the adze the faces were dressed with. They were interesting and unique specimens of construction, and looked fit to stand for many years.

R. PHILLIPS.

**The Chief Engineer of Newcastle.**—Mr. Hugh M'Kie (formerly city-surveyor of Carlisle) has been selected, out of fifty applicants, for the Chief Engineership of the borough of Newcastle-on-Tyne, at a salary of 1,000*l.* a year. Owing to circumstances, however, the actual appointment has been deferred for three months.



LEEDS MUNICIPAL OFFICES  
COMPETITION.

THE committee have awarded the premiums as follows:—1st, "Crayon," Mr. George Corson, Leeds; 2nd, "Hoc Securius," Mr. D. Brade, Lowther-street, Kendal; 3rd, "Spero," Messrs. Hill & Swann, Park-square, Leeds. We are informed that the designs will be open to the inspection of the public for one week from Tuesday morning last, in the Law Library, Town-hall, Leeds.

The following is the report made by Mr. Cockerell on the eight designs selected by the committee from the twenty-four submitted:—

"Having made a preliminary examination of the eight designs, and formed a rough estimate of their relative merits and of the apparent capability of the authors, I submitted them to a further very minute examination, adopting a system of marks which by ascribing to the several parts of the designs (whether of a practical or an artistic nature) a separate value, established a more accurate comparison of the several designs in their parts, and in their whole. This second examination, which considerably modified my first impression, in addition to furnishing a more reliable standard of the merits of designs as set forth in the drawings merely, was besides of a nature to give a clearer appreciation of the capability of the authors for carrying out such a work than would be furnished by the designs considering their positive aspect only.

I should, however, observe that, while I attach great weight to this last consideration, I have not taken it into account in the assignment of marks. Having made a third general examination and a revision of the scores, I added the following further considerations as motives in the recommendations which I should have to make:—(1.) That the first place as likely to lead to the carrying out of the work should be assigned to the competitors who, while receiving the highest number of marks, should also give evidence of the greatest capability and general knowledge. (2.) That for the secondary prize some additional consideration might be given to artistic merit and ingenious arrangement, apart from the question of the strict adaptability of the designs for execution. Having thus, as is due to the confidential commission with which you have honoured me, laid before you the method and notices of my selection, I have to state my conclusions. I consider the order of merit to be as follows:—(1) 'Crayon,' (2) 'Hoc Securius,' (3) 'Spero,' (4) 'Plato,' (5) 'L. P. O.,' (6) 'Nota Bene,' (7) 'Leodiensis,' (8) 'Q. E. D.' The three first compare in number of marks as 75, 61, 57 respectively. I have further to express my opinion that the designs of 'Crayon' give evidence of a degree of experience as well as of talent which may well justify you in entrusting him with the commission. 'Hoc Securius' exhibits considerable merit in artistic design, especially in the elevations. The design of 'Spero' is carefully considered, but is wanting in sufficient appreciation of scale in the elevations.

With regard to cost, I am of opinion that the sum assigned as a limit by the instructions, is insufficient for any building of an adequate character, and of the capacity required.

The design of 'Spero' approaches most nearly of the three to the limits, but this result is attained by somewhat contracting the areas of some of the spaces, as well as the height of the rooms and the elevation. Except in this respect, there need be no great difference between the cost of this design and of that of 'Crayon.' I shall be happy to furnish any further explanations of the above remarks, and to wait upon your committee should you require it.

Finally, I would venture to express a feeling, which I trust may not be regarded as an encroachment upon my office, namely, some regret that the instructions precluded my examining the whole of the designs sent in, as the considerable distance between the design which I have placed first and the others leads to surmise that a closer approximation of merit might possibly have been found. The more as the very precise and well-considered instructions left comparatively little scope for variety in the plans, and therefore necessarily made so much to depend upon the elevation."

## COMPETITIONS.

**Margate Drainage.**—At a meeting of the Town Council, on Tuesday last, the first premium, 200*l.*, was awarded to Mr. Lewis Angell, and the second premium, 100*l.*, to Messrs. Gotto & Beesley. The plans were sent in nearly three years ago, and the award has been made on the recommendation of Sir Joseph Bazalgette, to whom the schemes were referred.

**Wimbledon Local Board Offices.**—In response to an advertisement issued by the Wimbledon Local Board for designs for new offices (not to exceed 2,750*l.* in cost), twenty-two sets of drawings have been sent in. The committee appointed to make the selection reported in favour of the final selection being made from four, bearing the respective mottoes of "Ars longa, Vita brevis," "Delta," "Utility," and "Sanitas." Mr. Townsend (one of the committee) said (at a meeting of the Board) that the first-named was in the "Early English style of the sixteenth century" (!) with an overpowering quantity of glass; that of "Delta" was bold and attractive in design; while that of "Utility," he was persuaded, could never be carried out for the money the Board had resolved to pay. The plan marked "Sanitas" he considered decidedly the best for their purpose, and it was the only one that gave plate-glass windows, Milton's tiles for paving, and a Portland-stone staircase, and the estimated

cost was within their limit. Mr. Ashby expressed the hope that the Board would not be guided in their selection by the pretty appearance of the drawing, and Mr. Paxton having spoken briefly in favour of "Utility," the chairman proposed, and Mr. Wedlake seconded, that the plans marked "Sanitas" be accepted, which was agreed to without a single dissentient, Messrs. Ashby, Haynes-Jones, Paxton, and Thomas not voting. The letter accompanying the plan was then opened, and the author announced as Mr. Thomas Goodchild, of Duke-street, Adelphi.

ALDGADE EXTENSION OF THE  
METROPOLITAN RAILWAY.

THREE-FOURTHS of this extension are underground; but the breaks are so frequent as to promise ventilation. The line passes from what is called the Bishopsgate-street station under Liverpool-street and Bishopsgate-street; running thence parallel with Devonshire-street it goes through and under Devonshire-square, passing so as to touch the vast tea-warehouses of the St. Katharine Dock Company in Cutler-street, under Harrow-alley, Meeting House-yard, and Gravel-lane, and thence into High-street, Aldgate. The gradients are very satisfactory, being in fact almost nominal. The curve formed by the line is extremely gentle, having a radius of only 2,000 ft. The greatest depth of the rails below the surface is 28 ft., the level 17 ft., the average thickness of earth above the arches being 6 ft. As would naturally be expected in such a case, the excavations disclosed Roman and other remains of considerable interest. Among the former there were found fragments of urns, specimens of pottery, and bronze coins. The most remarkable discovery was that of a thick stratum of bullocks' horns, commencing about 20 ft. below the surface, and extending to an unascertained distance beneath. Although the deposit was doubtless made many centuries ago, the horns had suffered so little by decay that they found a ready sale in the market. The extension will tap the general passenger traffic of the whole of the eastern part of the City and the East end of London,—the Docks, Fenchurch-street, Mark-lane, Mincing-lane, Whitechapel-road, and Commercial-road; and, on stepping out of the Aldgate Station, one cannot fail to be struck with the vast stream of moving population to whose wants and convenience it will minister. The engineering superintendence of the extension works was entrusted to Mr. Francis Brady, engineer of the South-Eastern Railway; and, considering that a considerable portion of the buildings on the line had to be under-pinned, and that the tunnel had to be made of extra thickness in consequence of the great weight of the structures above, the virtual completion of the works between the beginning of March and about the middle of November may be regarded as creditable alike to the engineer and the contractors.

## ROYAL EXCHANGE EXCAVATIONS.

SIR,—Can any of your readers favour me with the address of Mr. Russell, who was some time clerk of the works to Sir W. Tite during the building of the Royal Exchange, and who made careful drawings of the antiquities, &c., discovered there? W. H. OVERALL.

Library, Guildhall.

## MASTERS AND MEN.

**Staffordshire Potteries.**—Fresh complications have arisen with regard to the wages question in the Staffordshire Potteries, which question is to be referred to arbitration, the employers having given notice of a reduction of 10 per cent. in wages. The turners and handlers of Burslem and Tunstall have resolved to hold aloof from the arbitration, and not to be governed by the decision of the Arbitration Board. Only the Hanley section of these branches of the potting industry will consequently be represented at the Board. The cratemakers have met and resolved to resist a proposed reduction of wages, notice of which has been given at Burslem only at present. The men say they have suffered a reduction of 20 to 25 per cent. in their wages in the last two years.

**Leeds.**—The Leeds Master Builders' Association has received six months' notice of a demand for an advance of wages from the operative masons. The masons ask that the wages be 36*s.*

per week in summer, 33*s.* per week for the first month, 30*s.* per week for the second, and 33*s.* per week for the third month in the winter quarter. The bricklayers, in a similar notice, state that they are satisfied with 1*l.* 15*s.* 5*d.* for fifty hours per week, but they demand walking-time to work at a certain distance; that no employer shall have over two apprentices at one time; that masters shall not sub-let; and that six months' notice of departure from these arrangements be given on either side.

**Huddersfield.**—The masons of Huddersfield have sent in a demand to the Masters' Association for an increase of wages to the extent of 4*s.* per week.

## WHO WANTS A CHURCH?

SIR,—As some friends of mine desire to build a handsome church for a clergyman of talent, I should feel obliged to any of your readers who would favour me with particulars of a district in or near London where a good new church is needed. Possibly some architect or builder who has recently laid out, or is about to lay out, a new district can furnish the required information.

T. K.

\*\*\* The writer has sent us his name and address. The offer is so liberal, that one is led to ask whether it is made in earnest?

## THE BIRMINGHAM BOROUGH SURVEYOR.

THE town council of the borough of Birmingham has just raised the salary of the borough surveyor,—Mr. William Spooner Till, C.E.,—to 1,000*l.* per annum. Mr. Till may be said to have been brought up in the corporation service, as he was a pupil of the late Mr. Piggott Smith, borough surveyor, and at whose death Mr. Till, at a very moderate salary, became his successor. Gradually, but without any interference on the part of Mr. Till or his friends, the town council, upon reports of its Works Committee, who had most experience of the ability and untiring industry of Mr. Till, has, from time to time, recommended an increase of salary, until now it stands at 1,000*l.*, which has been well earned and is richly deserved.

## PAVING APPOINTMENTS.

At the Hammersmith Police-court, on the 18th inst., Mr. Jones, clerk of the Fulham Board of Works, attended in support of a number of summonses for paving expenses under the compulsory powers of the Metropolis Local Management Act.

In one case the defendant complained of being charged more on account of a long frontage.

Mr. Bridge (the presiding magistrate) said he was of opinion that apportionments should be made according to the value of the property, and not by so much per foot frontage.

Mr. Paget (the other magistrate of the court), who happened to be on the bench, said he quite concurred in that opinion. He had not had any conference with Mr. Bridge on the subject, but he had looked upon it in precisely the same light.

Mr. Bridge said it would be worth the while of the Board to consider the question.

Mr. Jones asked the magistrate if he considered the apportionment was bad.

Mr. Bridge said he did not. He made orders for the payment, with costs.

## SEWAGE IRRIGATION.

THE unfortunate Local Board of Crewe state that the loss upon their sewage operations last year has been, in round numbers, not less than 4,000*l.*, which is a very serious state of things for a young town, constituted mostly of working men. At Ashby-de-la-Zouch, we are informed, there has been an income from the sewage farms amounting last year to 285*l.* 8*s.* 11*d.* Twenty-eight acres of ground, rented at 7*l.* per annum per acre, have, under sewage culture, in market garden produce, yielded an income equal in gross to 71*l.* 14*s.* 1*d.*, or about 35*l.* per acre gross. At Wrexham, Colonel Jones, V.C., makes sewage farming pay. At Aldershot, Mr. Blackburn has sold upon his sewage-farm this year thirty-five acres of potatoes for 700*l.*, the parties to dig, clean, and remove them at their own cost; viz., these potatoes have sold at a rate of 20*l.* per acre, the crop having cost nothing specially for manure. At Worthing, 1,000 tons of mangolds were grown by sewage, selling up as high as 1*l.*



per ton for a portion of the crops. So, that with good land, good sewage, and good farming, there will be some good obtained. Extravagance in law and in works must, however, be avoided. When the long-expected sewage report is out, we hope to learn something about the question.

### INTERVIEWING A "JERRY" BUILDER.

BY AN AMATEUR GOVERNMENT INSPECTOR.

Scene—On the "Shoots."

"TELL me, briek'l'er, is this mortar?  
Are these cinders?—is this sand?  
Who's the 'riddler'? who's the 'sorter'?  
Who's the 'boss' or master hand?"  
But the briek'l'er kept on grinning,  
Raised his trowel and struck a brick;  
One half went away fast spinning,  
T'other he in mud did stick.

"Tell me, hodman, is this plaster?  
Is this 'ballast'?—is this 'breeze'?"  
Is this scavage?" "Ask my master,"  
Said the hodman, "if you please."  
Turning to the master-jerry,  
Who was list'ning in my rear,  
He replied to my first query  
(With a curse), "What brings you here?"

"Business, sir, has brought me hither,  
From Whitehall I have come down.  
When I've done I'm going thither;  
But enough—I serve the Crown."  
At these words the "jerry" stagger'd,  
Closed his mouth, and bit his tongue,  
Wiped his brow, and felt quite haggard,  
Like one going to be hung.

Thus I "sold" the rampant "jerry";  
Then with pencil pointed neat,  
Took some notes to prove what very  
Rotten work my eyes did meet.  
All the briek'l'ers stared and wonder'd,  
All the hodmen watched me off,  
And the "boss" that crewlike thunder'd,  
Gave a dismal churchyard cough.

### Books Received.

*Tramways: their Construction and Working.*  
By J. EMERSON DOWSON, and ALFRED DOWSON,  
A.A.I.C.E. London and New York: E. & F. N.  
Spon. 1875.

THE rails and sleepers of a tramway, and their supports, have to be considered very differently from those of an ordinary railway. Originally, in the permanent-way of railways, the rails were laid on stone blocks,—at least in cuttings and on solid ground,—but the permanent-way thus formed was too rigid. Heavy weights running at high speed require some elasticity in the permanent-way. In an ordinary railway, the sleepers are laid in loose ballast, which is well drained, easily accessible, and the sleepers can at any time be packed up to their proper level; but tramways are usually laid in public roads, the paving of which is rigid, and therefore the rails and their supports should be so too. As it is necessary to cover up the sleepers with the paving or other materials of the roadway, they cannot be readily packed up, as in a railway, and it is, therefore, additionally necessary to make them so that they may not require this attention, the benefit of elasticity being unattainable.

The form of tram-rails is somewhat difficult. They must not project above the roadway, in order that they may not obstruct the wheels of ordinary vehicles, and the surface of the rails being thus level with the roadway the drivers of carts and wagons endeavour to let them run on the tram-rails, because the traction is easier for the horses; but the wheels cannot be kept fairly on the rails, and run sometimes on them and sometimes on the adjoining paving, wearing it away unequally, and when the carts and wagons are heavily laden and without springs the jolting causes the tramway to be much shaken and loosened, and the paving at the sides to be worn away. It is the object of the authors of this well-written treatise to show how the defects of tramways may be lessened, and the excessive cost of repairs reduced; and this they do under the several heads of *Construction and Equipment, Working Expenses and Maintenance, Mechanical Motive Power, and the Working of Traffic.*

It appears under this latter head that, "when on a level, or nearly so, it is found in practice that a pair of horses can draw about double the load on a tramway that they can on an ordinary

road; but on inclines, although the smooth rails make the traction easier, the force of gravity tending to draw the car backwards is not counteracted in any appreciable degree by friction, and if heavy cars are used the strain on the horses is seriously increased on inclines steeper than 1 in 50 or 45. On this account, as well as for economy in working, steep gradients should be avoided, or, if used, they should be as short as possible."

In a tramway, unlike a railway, one of the greatest difficulties is to keep the rails fastened down. When the rails are laid on continuous timber bearers, the fastenings work loose, and when iron supports are used at intervals a jolt or shock is given to the car as it rides over them. To meet these objections the authors have designed an iron permanent way, with continuous cast-iron bearers, and they say it is considerably cheaper than the system with continuous timber bearers.

In an appendix are given the returns of fourteen horse-lines in the State of New York, from which it appears that as much as 70 or 80 per cent. of the gross receipts is absorbed by the expenditure, which is chiefly owing to the great cost of horse-renewals and horse-keep. The total expenses of ordinary steam railways do not usually exceed from 45 to 50 per cent. of the gross receipts.

The authors have given a good deal of practical information on the subject of tramways within a small compass, in every part of the book going straight to the point in question.

*The Extravagant Expenditure of the London School Board: showing how a Quarter of a Million of Money has been Thrown Away.*  
London: Edingham Wilson.

THE author endeavours to make out his case thus. The earlier Board schools were erected from the designs of architects holding no permanent official position in connexion with the Board; all the subsequent ones were designed by the permanent architect of the Board. The author gives figures to show that those designed by "outside architects" provide accommodation for 26,358 children, at a cost, exclusive of site, of 209,245*l.*, or 7*l.* 18*s.* 9*d.* per child, and that the schools erected from the designs of the Board architect have, up to the present time, provided for 98,182 children, at a cost of 1,010,320*l.*, or 10*l.* 5*s.* 10*d.* per child. This simply means in plain English, he says, that if the School Board had even only continued to erect schools upon the same principle as that upon which they began, they would up to the present time have saved to the ratepayers an expenditure of nearly a quarter of a million of money.

The writer adds, in arriving at these figures, "the cost of each school designed by what I may call the 'outside architects,' includes the architects' commission and other expenses of superintendence, whilst the remaining Board schools, having been designed by an officer of the Board, are not charged with any commission."

Something depends on the accuracy of his figures, and something more on the answer that would be given to the question,—Is the same amount of accommodation afforded to scholars and teachers in the earlier as in the later schools? On economic grounds the inquiry is worth settling. From an artistic point of view there needs no discussion at all.

### VARIORUM.

"THE Rose and the Lily, and how they became the Emblems of England and France," is the title of a Fairy Tale, by Mrs. Octavian Blewitt, just now published by Chatto & Windus. It is a charming little story, charmingly told; parts of it with a vigour and brightness which lead us to expect it will not be long before we find Mrs. Blewitt in another path. "The Rose and the Lily" has an additional attraction in the shape of a frontispiece "designed and etched by George Cruikshank, age 83, 1875." It is both powerful and graceful, and etched with so firm a hand, that many will ponder over "age 83." Mrs. Blewitt's story, in its cover of white and gold, will make a charming little gift-book for Christmas.—A third edition has been published of "Mushrooms and Toadstools," by Worthington G. Smith (Hardwicke & Bogue). The object in view is to teach the reader to distinguish easily the difference between edible and poisonous fungi. Mr. W. G. Smith, who is *facile princeps* in fungi, illustrates his remarks with reduced copies of two valuable plates, published

by him some time ago, one showing twenty-nine edible and the other thirty-one poisonous species. Our author evidently says, with Friar Lawrence:—

"For nought so vile that on the earth doth live,  
But to the earth some special good doth give."

"An Architect's Letter upon Sewer Gas and House Drainage," by Henry Masters, Architect (Spon) re-urges the necessity for cutting off the house from the sewer, and describes a double trap used by the author.—Fourteen Stories by Mr. Sala, Mr. Dutton Cook, Miss Braddon, and others, with eight page-illustrations, which go to make up the *Belgravia Annual* for Christmas, cannot be dear at a shilling.—Mr. Walford, in the last published part of "Old and New London," writes thus as to Knightsbridge:—"In the early Saxon days, when 'Chelsey,' and 'Kensing town,' and 'Charing' were country villages, there lay between all three a sort of 'No Man's Land,' which in process of time came to be called 'Knightsbridge,' although it never assumed, or even claimed, parochial honours, nor indeed could be said to have had a recognised existence. It was a district of uncertain extent and limits; but it is nevertheless, our purpose to try and 'beat the bounds' on behalf of its former inhabitants. The name of Knightsbridge, then, must be taken as indicating, not a parish, nor yet a manor, but only a certain locality adjoining a bridge, which formerly stood on the road between London and far distant Kensington. There is much difficulty as to the derivation of the name, for in the time of Edward the Confessor, if old records are correctly deciphered, it was called 'Kyngeburgig'; while some hundred years or so later we find it spoken of as 'Knightsbrigg,' in a charter of Herbert, Abbot of Westminster. A local legend, recorded by Mr. Davis, in his 'History of Knightsbridge,' says that:—"In ancient time certain knights had occasion to go from London to wage war for some holy purpose. Light in heart, if heavy in arms, they passed through this district on their way to receive the blessing awarded to the faithful by the Bishop of London at Fulham. For some cause or other, however, a quarrel ensued between two of the band, and a combat was determined upon to decide the dispute. They fought on the bridge which spanned the stream of the Westbourne, whilst from its banks the struggle was watched by their partisans. Both fell, if the legend may be trusted; and the place was ever after called Knightsbridge, in remembrance of their fatal feud."

The *American Architect* says:—"Among the interesting things that were shown to the architects in Philadelphia, during their Convention, was the patented process of Messrs. Struthers & Sons, for sawing granite. Hitherto it has been found impracticable to cut granite with a saw, since the ordinary sand process would cut only 1½ in. or 2 in. per day. The inventor of the Messrs. Struthers's process hit upon the idea of using chilled iron, finely divided, instead of sand. A jet of steam is directed upon a fine stream of melted iron, and blows it into spray, just as in the common 'atomiser' a jet of air pulverises, so to speak, the stream of liquid upon which it is turned. The iron, divided into fine globules of (say) 1.40th in. or 1.50th in. in diameter, falls into cold water, and is chilled into excessive hardness. It is used under a saw of soft iron, and with a stream of water, as sand is used in sawing marble. Most persons would have supposed that the scratching of angular grains of sand would be more efficient than the rolling friction of globules of iron; but it would seem that the sand is speedily crushed into dust, while the tough iron, simply wearing down into smaller and smaller globules, crushes its way through the felspathic and other crystals of the granite (which with us is usually sienite, by the way, and not granite). The rolling of the globules is curiously shown by fine channellings, or flutings, which score the under-edge of the saw from end to end. By this device granite can be sawn at the rate of 3 in. or 4 in. per hour, and at small expense, the waste of the iron being about 3 lb. for every square foot of kerf, or two square feet of sawn surface."

**A Bishop's Throne for St. Finbarre's Cathedral, Cork.**—A movement is on foot to erect a bishop's throne in the new cathedral of St. Finbarre, Cork, as a testimonial to the present bishop, Dr. Gregg. The estimated cost is 500*l.*, and the work will be carried out from the designs of Mr. W. Burges, the architect of the building.



## Miscellaneous.

**Barrow Opening at Whitby.**—The Rev. Canon Greenwell, with the Rev. C. J. Atkinson, vicar of Danby, has just been conducting the examination of a series of barrows on Sir Charles Strickland's moors, near Whitby, and now gives the result of his investigations. A large barrow near the Flaak Inn was found to have been previously disturbed at the centre, but a secondary interment, a burnt body, was found, accompanied by flakes of calcined fluid. Beneath a large, irregularly-shaped flat stone, near the central disturbance, was found a small grave, 2 ft. square and 16 in. deep, over and in which the fire had evidently been made that had burnt the body within it. Additional interest attached to this barrow from its peculiar formation; the appearance indicating a conically-shaped "house" of about 40 ft. in diameter, and 4 ft. to 5 ft. high. Subsequent enlargement of the area had taken place at the secondary interment, and a ring of stones 2 ft. in height had had soil heaped upon them to form a circular platform, with a gradual slope from centre to periphery. Near the above, a smaller barrow was opened, and a grave was found sunk about 2 ft. below the natural surface, and about 4 ft. square. This was filled up with tempered clay, below which was a very thick layer of charcoal; and scattered over this the bones of a burnt body were found, which had possibly been burnt in position. A larger barrow (60 ft. in diameter) on the farm of Mr. John Stanghow, Lythe, was opened, and a cist (which seemed to have been disturbed) was met with.

**The Portico of St. Martin's-in-the-Fields.**—At a meeting of the St. Martin's Vestry on the 15th inst., the chairman (the Rev. W. G. Humphrey, vicar) stated that he had received a copy of a report purporting to come from the engineer and architect of the Metropolitan Board of Works upon certain improvements that it was proposed to make by forming a new street from Tottenham-court-road to Charing-cross. There was but one point in the proposal to which objection might be urged, and that was the plan of the street included the taking away of the steps from the portico of the parish church, and to place the columns upon a wall similar to that at the National Gallery. He considered that to take away those steps would be simply to mutilate and spoil one of the monuments of the metropolis. If altered in the way proposed, he held that it would become an architectural monstrosity and absurdity. He did not believe that the alteration was necessary for carrying out the improvement. As the vaults extended beyond the church, the steps were parts of the consecrated portion. Mr. Churchwarden Scott agreed with the remarks made by the vicar, and considered the removal of the steps would be a great mutilation to the church. It was then resolved that, having heard the statement of the vicar, the Metropolitan Board of Works be informed that this vestry deprecates any interference with the parish church. Mr. Dalton said he had opposed at the Board of Works any interference with the church, and had said it would simply be vandalism to touch the portico.

**Burning Public Lamps by Meter.**—The Gas and Water Committee of the Vestry of Paddington report that the average meter system has now been in operation for a period of two years, ending the 30th of September last, and that the actual saving effected thereby, after payment of inspector's salary, and maintenance of meters, governors, &c., has been 678*l.* 12*s.* 7*d.* or at the rate of 7*s.* 10*d.* per lamp per annum, being 7*d.* more per lamp than last year. This amount, when added to the sum gained by closing the lamp-rental account, and the saving to be effected by the readjustment of governors, &c., will relieve the lighting rate to the extent of 1,650*l.* per annum. There are 1,730 lamps in the parish alluded to.

**Plumstead Common.**—The Metropolitan Board of Works has somewhat tardily decided to take the Plumstead-common question in hand. At its last meeting it was resolved,—"That it be referred to the Works and General Purposes Committee to consider and report what steps, if any, should be taken by this Board to secure Plumstead-common for the public as a recreation ground, with power to confer with her Majesty's Government thereon."

**Scavenging in Dublin.**—The streets of Dublin must be even worse than those of London to justify the *badinage* of Mr. C. J. O'Donel, one of the magistrates at the Dublin Police-court, who on the 9th inst. had to hear a case of assault in which one of the plaintiffs said her husband "was a scavenger." The following dialogue is reported to have ensued.—His Worship.—Why, then, you are a widow? Complainant.—No, your worship. His Worship.—Sure I thought you said your husband was a scavenger? Complainant.—Yes, your worship, and he is a scavenger. His Worship (surprised).—A scavenger! and is he alive? Complainant.—Yes. His Worship.—And is he working? Complainant.—Yes sir; every day. His Worship.—Is it in Dublin? Complainant.—Yes. Mr. O'Donel (evidently astonished).—Who ever saw such a thing in Dublin, these years, a living scavenger! Is he a real living scavenger? Complainant.—Yes, sir. His Worship.—The idea of there being actually a living scavenger in Dublin!

**Brompton Consumptive Hospital.**—At the last quarterly Court of the Governors the report of the Committee of Management stated that ever since the previous Court of Governors the western half of the hospital had been in the hands of the engineers and builders, who had been carrying out extensive improvements in the warming and ventilation of that part of the building. With the view of improving the sanitary arrangements, additions to both wings were also in progress. All these works had necessitated the closing of more than half the wards; hence the list of applicants had become much more crowded than usual, and the period of waiting was unavoidably lengthened, which the committee much regretted. The inconvenience arising from the unlooked-for delay in the completion of the works had been great, and their cost would be very considerable; but the committee believed that the well-being of the inmates would be materially promoted by the improvements.

**Health Lectures for the People.**—The first of a series of "Health Lectures for the People," organised by the Manchester and Salford Sanitary Association, was given on the 15th inst., by Dr. Ransome, Professor of Hygiene at Owens College, on the subject of "Foul Air and Lung Disease." Dr. Ransome said that three-quarters of a million of people died during the last ten years from diseases of the lungs not consumption. He discussed at length the evils arising from smoke, various trades and manufactures, putrefaction, and other causes. The Artisans' Dwellings Bill, which was intended to aid local governments in opening up crowded portions of towns, had been adopted with success in many large towns; but as yet Manchester had not adopted it, though the need that something should be done was very great, for there were parts of the city, especially in Ancoats, where it was a mockery to call the houses homes.

**Paving and Road-making at Islington.** At a meeting of the Islington Vestry on the 17th inst., it was resolved:—

"That, in all cases of roads and footpaths in which the compulsory powers of the Metropolitan Management Acts have been, or shall hereafter be, put in force (the moneys for which have been received), or which the Highways or Sewers Committees have directed, or shall direct, to be made or flagged, tenders be invited and contracts entered into by the committee having charge of the works on behalf of the vestry; that the surveyor inspect the works, and see that they are properly executed, and that the materials are such as are required by the existing regulations, or by any regulations hereafter to be made."

At the same time, the vestry decided to take steps for borrowing 40,000*l.*, the estimated cost of cubing the macadamised margins alongside the tramways in Upper-street and Holloway-road (to and including the intersection of the Seven Sisters-road), and in the Essex-road, up to and including the intersection of the Ball's Pond-road.

**Fall of a Building in Sheffield.**—On Wednesday night last week an accident occurred in a row of new buildings, called Prospect-terrace, in Grimesthorpe-road, Sheffield. Mr. Curtis, contractor, and four of his workmen, were engaged in putting the rafters on a house at the end of the terrace, when the gable end gave way, the whole building, with an adjoining workshop, falling with a great crash. When a clearance could be effected it was found that all the five persons were badly hurt. Two were taken to an infirmary, where they now remain in a dangerous condition. Mr. Curtis and two of his workmen were taken home seriously injured.

**Polluted Well-water at Tottenham.**—At the Edmonton Petty Sessions, on the 20th inst. Mr. Henry Baynard was summoned at the instance of the Local Board of Health, to show cause why an order should not be made as to a certain well, situate at the rear of Seven Sisters-cottage, Hanover-road, Tottenham, the water of which was used, or likely to be used, for drinking or domestic purposes, and was so polluted as to be injurious to health. Dr. Watson, the medical officer of health for the district, had reported that the water was very bad, and unfit for drinking purposes, and the defendant had made an offer to close the well, so far as the water was used for drinking purposes. An order was then made to close the well, so far as the water was used for drinking purposes. Another owner and occupier was summoned in a similar case, and in this instance an order was made for closing the well in six months.

**British Archaeological Association.**—At the first meeting of the session, held last week, in the course of the proceedings an elaborate paper by Mr. Roach Smith was read by Mr. Isaac, detailing his survey of the Roman stone street from London to Chichester. The perambulation was commenced at Ewell, and continued to its termination. Mr. Loftus Brock, F.S.A., detailed the discovery of a part of the Roman wall of London in Camomile-street, and also that of several sculptures of much interest, found built up as old material within it, on its demolition. The discovery of further sculptures, and the head of a statue of large proportion, and probably of the period of the Antonines, was also announced, and Mr. Haviland exhibited a rubbing from one of the stones.

**The Parliament House of Owen Glendower at Dolgelly.**—A correspondent writes to the *Athenaeum*:—"I do not remember to have seen in any London newspaper notice of the threatened destruction of a building which must nevertheless, I suppose, be of interest, not only to all Welshmen, as a monument of the final struggle of their country for independence, but to antiquaries and even, in a less degree, to every reader of Shakspeare,—the Parliament House of Owen Glendower at Dolgelly." He hopes that it may yet not be too late to call attention to the subject, which was referred to in the *Builder* some months ago.

**"Back-to-Back" Houses in Altrincham.** The Altrincham Rural Sanitary Authority has determined to prevent the erection of "back-to-back" houses in future, and, more than this, to insist on the demolition or alteration of many of the existing houses of that kind in its district. The unhealthiness of such buildings has long been demonstrated, yet one of the members of the Altrincham Authority said he "thought it was a great mistake to do away with those 'back-to-back' houses, unless they would compensate those people for the loss of their rents." He confessed, however, that he was the owner of "back-to-back" property in Salford.

**Association of Employers of Labour in the Building Trade.**—The Association, which numbers among its members a large number of gentlemen interested in the building trade of Croydon and district, held its first annual dinner at the Greyhound Hotel on the 14th inst. In many of the after-dinner speeches allusion was made to the strong desire felt by employers that a good understanding should exist between their workmen and themselves, but at the same time it was stated that the combined masters would resist any unjust demand which might be made by the workmen in their pay.

**Death of a District Surveyor.**—At the last meeting of the Metropolitan Board of Works, the Superintending Architect (Mr. G. Vulliamy) brought up a report relative to the vacancy in the district surveyorship of Bethnal-green (East), caused by the decease of Mr. Robert Culver James. The subject was referred to the Building Act Committee. Mr. James was one of the most recently appointed officers of the Board.

**A River of Ink.**—Report has it that a river of genuine ink has been discovered in Algeria. It is formed by the union of two streams, one coming from a region of ferruginous soil, the other draining a peat swamp. The water of the former is strongly impregnated with iron, that of the latter with gallic acid. When the two waters mingle the acid of the one unites with the iron of the other, forming a true ink.



**Boardings in the Holborn District.**—At the meeting of the Holborn District Board of Works, on the 20th inst., Mr. Clarke drew attention to the great height of boardings in different parts of the district. They generally exceeded 20 ft. in height, and one was so high that it got blown down. The surveyor (Mr. Isaacs) replied that he believed he had no control over the height of boardings, though he had power to determine the projection, and the length of time they should stand. He would confer with the clerk on the subject.

**A Trade Book.**—Messrs. Jas. Shoolbred & Co. have issued a book of "Designs for Furniture," illustrative also of Interior Decoration. As a whole it is superior to the ordinary run of upholsterers' pattern-books, and people who happen to have good taste may get good things out of it. No names of designers are given. The illustrations are all produced by Messrs. Whiteman & Bass.

### TENDERS

For boilers and baths, gasfitting, and stoves, Newington Workhouse, Walworth-common. Messrs. Henry Jarvis & Son, architects:—

Boilers and Baths.	
Jeakes & Co.	£878 0 0
Lefevre & Co.	706 0 0
Green & Co.	647 0 0
Fraser Bros.	629 0 0
J. & F. May	591 17 0
Smeaton & Sons	525 0 0
Chandler & Sons	510 0 0

Gas-fittings.	
Jenrick & Morgan	£573 0 0
Cannon	498 10 0
Green & Co.	485 0 0
Heath	450 0 0
Miller	444 15 0
Bliss & Co.	400 0 0
Lefevre & Co.	322 4 7
Chandler & Sons	290 0 0

Stoves.	
Jeakes & Co.	£543 0 0
May	508 0 0
Downs	489 0 0

For fittings, Northumberland Arms, for Mrs. Green. Mr. W. Paice, architect:—

Fitter's work.	
Richards	£70 10 0
Gas-fitting.	
Wilman	£120 0 0

For alterations, &c., at the Blade Bone, Bethnal-green-road. Messrs. Bird & Walters, architects:—

Kelly Brothers	£1,425 0 0
Brown	1,410 0 0
Newman & Mann	1,370 0 0
Lawrence	1,315 0 0
Williams & Sons	1,294 0 0
Hookly	1,215 0 0
Nightingale	1,197 0 0
Anley	1,095 0 0

For butcher's premises, on Harding's-hill, South Shields, for Mr. G. Birkitt. Messrs. Penning & Rudge, architects. Quantities by the architects:—

Young	£414 3 0
Harwood	392 7 8
Joeurs	335 0 0
Hunter	290 0 0
A. & P. Marshall (accepted)	288 4 0

For additions to Westoe House, Westoe, South Shields, for Mr. T. B. Barker. Messrs. Penning & Rudge, architects. Quantities by the architects:—

A. & P. Marshall	£398 18 0
Nichol	359 16 2
Harwood (accepted)	351 17 10

For repairs and decorations to the late residence of Alderman Challis, Enfield. Mr. T. J. Hill, architect:—

Heaps	£612 0 0
Bentley	595 0 0
Patworth (accepted)	429 0 0

For restoring Vicarage House, St. Botolph, Charterhouse-square, for the Rev. Flood Jones:—

Jarvis & Sons (accepted).	
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For residence at Birdhurst, Croydon, for Mr. G. E. Brock:—

Hobbs (accepted)	£1,700 0 0
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For the erection of dwellings, Peel-street, Kensington, for the National Dwellings Society (Limited). Mr. E. Evans Cronk, architect. Quantities supplied by Messrs. J. & A. E. Bull:—

Rider	£21,938 0 0
Sewell	21,300 0 0
Bywaters	2,983 0 0
Adamson	2,900 0 0
Sheppard	20,650 0 0
Hill, Higgs, & Hill	20,400 0 0
Downs & Co.	20,160 0 0
Chappell	20,000 0 0
Collis	19,870 0 0
Kirk & Randall	19,890 0 0
Nightingale	19,432 0 0

For labour only to a waste factory at Daybrook, near Nottingham, for Mr. John Harrison. Mr. T. G. Alderson, architect. Proprietor finds materials:—

Davis	£196 10 0
Lewis & Carter	193 0 0
Carlin & Co.	187 10 0
Terry & Langley	159 0 0
Parnall & Flinders	139 15 0

For pulling down and rebuilding No. 15, and for additional story to No. 16, Bartholomew-close, for Mr. R. T. Collins. Mr. George Judge, jun., architect. Quantities supplied by Mr. W. H. Brayshaw:—

Palmer & Son	£2,324 18 0
Collis & Son	2,235 0 0
Titmas	2,141 0 0
Hawtre & Son	2,128 0 0
Boyce	2,074 0 0
Sewell & Son	2,064 0 0
Corder	1,985 0 0
Deards (accepted)	1,844 0 0

For a portion of the ironwork in the construction of the new public baths at White Rock-place, Hastings. Messrs. Cross & Wells and Jeffery & Skiller, joint architects. Quantities supplied:—

Rother Ironworks Company	£3,392 11 0
Rosser & Russell	3,323 9 3
Fraser Brothers	2,988 0 0
Homan & Rodgers	2,460 0 0
Bunnett & Co.	2,417 2 0
Turner	2,351 9 6
Turner & Co. (too late)	2,315 14 0
Geilgud	2,304 5 0
Shaw & Co. (accepted)	2,241 10 0

Messrs. Moreland & Son, Fowler, and McLaren & Co. tendered for a portion only of the work.

For erection of a chapel, vestries, and schools, Redland-road, Bristol. Mr. Robt. Curwen, jun., architect. Quantities by Messrs. Newton & Bamford:—

Pugley	£8,999 0 0
Davis	8,495 0 0
Wilkins & Son	8,200 0 0
Krauss	8,089 0 0
Howell	7,813 0 0
Church & Phillips	7,650 0 0
Stephens & Bastow	7,490 0 0
Foster (accepted)	7,421 0 0
Baker & Son	7,330 0 0

For erection of a chapel and vestry, Thornbury, Gloucestershire. Mr. Robt. Curwen, jun., architect. Quantities by the architect:—

Hudson & Tucker	£2,760 0 0
Saize & Son	2,450 0 0
Brown	2,091 0 0
Williams-Mark	1,991 0 0
Foster & Son (accepted)	1,636 0 0

For building a factory in Nelson-street, Peter-street Hackney. Mr. Mundy, architect:—

Thomson	£1,695 0 0
F. & T. J. Wood	1,675 0 0
Batchelder	1,673 0 0
Ennor	1,632 0 0
Crocker	1,492 0 0
Nightingale	1,473 0 0
Hearle	1,445 0 0

For building warehouses, Bethnal-green-road. Mr. Mundy, architect:—

Wire	£1,498 0 0
Batchelder	1,443 0 0
Crocker	1,387 0 0
Thomson	1,292 10 0
Hearle	1,247 0 0
Wood	1,234 0 0
Nightingale	1,197 0 0
Hall	1,075 10 0

For alterations and additions to the Rookery Mansion, Westcott, for Mr. George Arthur Fuller. Mr. F. J. Dibble, architect:—

Collis & Son	£593 0 0
Heselgrave	549 0 0
Lynn & Dudley	495 0 0
Putney	453 6 0

For the erection of a detached villa at Barnett, for Mr. T. M. Weston. Mr. Fras. L. Pither, architect:—

The National Co-operative Builders' and Contractors' Society (accepted)	£800 0 0
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For building superstructure of warehouses in Miles-lane, City, for Messrs. Mezzeson & Co. Mr. F. Chambers, architect. Quantities supplied by Mr. Mark W. King:—

Newman & Mann	£3,085 0 0
Abby & Horner	3,030 0 0
Brass	2,997 0 0
Macey	2,988 0 0
Patman & Fotheringham	2,983 0 0
Harrison & Wood	2,937 0 0
Holland & Hannen	2,915 0 0
Browne & Robinson	2,723 0 0
Corder	2,685 0 0

For building new premises, Cannon-street. Messrs. Taylor & Locke, architects. Quantities supplied by Mr. Wm. Birdseye:—

Newman & Mann	£22,382 0 0
Browne & Robinson	22,138 0 0
Brass	21,471 0 0
Deards	21,297 0 0
Sewell & Son	21,160 0 0
Kilby	20,970 0 0
Sheppard	20,800 0 0
Mortier	20,230 0 0

For the erection of an hotel on the site of the Three Nuns Tavern, Aldgate, in the City of London. Messrs. Tarring & Wilkinson, architects. Quantities supplied:—

Browne & Robinson	£10,798 0 0
Newman & Mann	10,543 0 0
Perry & Co.	10,370 0 0
Burman	9,600 0 0
Brascher & Son	9,150 0 0
Wagner	8,860 0 0
Stephenson	8,392 0 0

For a house, corner of Frogual-lane, Hampstead, for Mr. W. Read. Mr. T. K. Green, architect. Quantities supplied by Mr. John Scott:—

Sharphington & Cole	£2,690 0 0
Newman & Mann	2,649 0 0
Dove Brothers	2,647 0 0
Browne & Robinson	2,612 0 0
Berriener & White	2,591 0 0
Burford	2,568 0 0
Longmore & Burge	2,566 0 0
Manley & Rogers	2,433 0 0

For additions and alterations to White Hall, Hornsey-lane, for Mr. G. Wills. Messrs. Lander & Bedells, architects. Quantities supplied:—

Axford	£3,850 0 0
Brass	3,817 0 0
Newman & Mann	3,736 0 0
Dove Brothers	3,976 0 0
Williams & Son	3,977 0 0

### TO CORRESPONDENTS.

*Bricklayers' Technical Education Committee, and Institute of Architects.*—We have received a copy of correspondence; it shall have attention next week.

J. W. H.—R. P.—L. & M.—D. W.—R.—Mrs. M.—C. C. H.—Mrs. J. L. M.—J. W.—J. A. M.—R. C.—E. S. R.—L. H.—H. R.—G. & R.—F. J. D.—W. H. B.—Town Clerk, Leeds.—Surveyor.—J. P.—A. H.—H. W.—R. W. G. H.—J. J.—Dr. P.—W. H. O.—C. F. S. W.—C. B.—F. B. P.—Dr. N. (we are compelled uniformly to decline).

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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# The Builder.

VOL. XXXIV. No. 1765.

SATURDAY, DECEMBER 2, 1876.

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### "A Book on Building."



MR EDMUND BECKETT has placed his friends and enemies under a fresh obligation. He has just written another book; and it is offered, as a kind of building guide, philosopher, and friend to that vast mass of the community entirely ignorant of the building art by one who undoubtedly possesses a little knowledge of it.\*

To those who have listened to Sir Edmund's utterances upon architecture, to those who can read between the lines of his book, it will prove useful; and it is full of excellent instances and practical exposures. It records petty reminiscences of crass professional stupidity counteracted by the ready wit of an employer determined to be master of the man whom he pays to advise him; and, moreover, two or three dicta concerning legal points not yet entirely understood by either architects or lawyers, which, coming from a distinguished Queen's Counsel, are of too much value to both professions to be overlooked or disregarded. The book is divided into six chapters, and contains a catalogue giving the dimensions of churches which originally appeared in our pages, and will be found valuable for purposes of reference. The legal portions fill but a few out of some 350 pages; the pith of the work treats of principles of construction and house building; and our intention is to examine the first four chapters, leaving the two last relating to church-building and domes for another occasion.

The author, though his foot is planted firmly, and with no light tread, upon the path marked out by himself, has not declined to give several reasons for "offering advice on architecture and building." One of these is that in spite of the multitude of treatises relating to both there are none which give "practical information how to avoid legal or structural mistakes"; another that he has been building for other people or himself during nearly a quarter of a century; and also because, in his own words,—

"I have substantially designed sundry churches and other buildings of considerable size, viz., the two Great Northern Railway Churches of St. James, Doncaster, and the one a mile north of Peterborough, St. Mary's, Lichfield, except the tower which had been rebuilt before; St. Chad's, Meadingley, near Leeds; a small church at Cliffe, in the East Riding; and Mr. Bass's, St. Paul's Church, at Burton, which is, of unusual size for a modern one; also the Grammar School at Doncaster; the extension of Lincoln's Inn Library; the tower top of Worcester Cathedral, which had never been finished in Gothic times,

and was formerly of a mean design in brick and plaster; and a house of my own near St. Alban's, covering 1,000 square yards; besides some smaller buildings not worth mentioning. I mean, that in all these cases the architects accepted my designs, and added little or nothing of their own. I do not include the great parish church of Doncaster, with which I have seen my name more associated than with these others, because that was designed in all its leading features, and especially its dimensions, by the greatest of modern Gothic architects, whom I need not name, though some things in it were modified at my suggestion, and others added or altered since the building."

This quotation serves to exhibit the kind of authority to whom the public, not the profession of architects, is invited to listen; and, though a part of it may not please some perhaps to whom allusion is made, we may remind them and everybody else that it is capable of diverse interpretation. The happiest home is often one in which the husband reigns as constitutional monarch, and the wife, like a wise cabinet-minister, "never shows she rules."

But we shall better prove our indebtedness to Sir Edmund by commending the incisive manner in which he exposes the fallacy of architectural competition as it is at present, and has long been, conducted. Practically a competition does just the reverse of what it is intended to do in theory. Instead of being a fair stand-up fight between architects in large practice and others with little or none, it often excludes the former, who do not think the game worth the candle; instead of being a means whereby genius is enabled to emerge from obscurity, or gifted poverty to descend from a garret, it is simply a trial of skill and pictorial device between men who work, not up to their own, but down to the public taste; and who seek to attract, often by systematically false drawings or fantastic designs in a novel style,—that is, a style with which the judges, sometimes vestrymen and their friends, are not familiar. To use Sir Edmund's own words:—"In a discussion on the 'Hope of Architecture,' at the Royal Institute of Architects, in December, 1874, I said that any architect would make me a very different design if I employed him directly from what he would send in for any competition; when the president, Sir Gilbert Scott, most significantly interjected, 'We are obliged.' " This little anecdote, the circumstances of which we distinctly remember, is literally correct; and it tells in a few words, not only the secret of architectural competition, confirmed by one who, from long experience and some profit, must know, but also the origin of half the new public buildings which disfigure the metropolis, and annoy all educated men, though probably none more than those architects whose names are indelibly written upon them. From the fallacies of competition to fallacious tenders is but a step; from the responsibility of individuals to the power of a general body is another; and our author, with a compliment to Mr. Ayrton, advises people who desire to build to adopt the course of the Government by making a preliminary arrangement with an architect about the sum he is to be paid and the manner of its payment,—hitting a little roughly

at the "Rules for Professional Practice" accepted by the majority of London architects; and describing them, in the words of a certain judge, as a private code presuming to set itself above the common law. Though declining to reprint or even criticise those "Rules," which, "as a lawyer," he says, produce the exact contrary to what they are intended to effect, he gives all the clauses of the usual agreement between Government commissioners and an architect employed upon public works. These, he thinks, are capable of improvement in minor points; and to clause 17, which is,— "No rules of the R.I.R.A., or any other society, to be held binding on the commissioners,"—he adds, in a parenthesis,— "This is *ex abundanti*," since the whole agreement is opposed to the whole principle of those rules." He also gives a suggested form of conditions for architectural competitions; a form of contract between a building firm and a committee; some practical talk about "quantities," schedules of prices, tenders, "extras," divided contracts, an architect's responsibility, and the modern necessity,—we may add the almost English necessity,—for a clerk of the works.

It is not, however, as a lawyer that the author of "A Book on Building" seeks the suffrages of the public; nor does he care to be recognised either as a scholar or a man of science. He voluntarily presents himself,—and with some little emphasis,—as the pure and simple "practical man"; and, as if to show his contempt for higher things, he confounds the third and fourth epistles of Pope, misquoting,—

"What brought Sir Visto's ill-got wealth to waste?  
Some demon whisper'd, 'Visto, have a taste,'"

in a sentence at p. 67, where he declares that "the best builders' houses . . . are infinitely better . . . than the vulgar monstrosities . . . which architects are planting over the estates of some of the great metropolitan landlords, to whom, as to Sir Balaam in the poem, 'Some demon whispered, Have a taste.' " He neither permits the supposition that there is any philosophy in architecture, nor admits the use of reasoning by analogy in discussing it. His doctrine about styles, and his apparent disregard of the difference between a style, the style, and style (admirably explained by M. Viollet-le-Duc) demand more elucidation than he has given. He says that the word "style" is a technical one, and that the only question now is, which of the old or existing styles we are to use for any particular building. In all humility we presume to dispute this proposition, and to deny that the word "style" is a technical one. What is the style of our time amongst ladies and gentlemen? Is it not to be simple, unaffected, honest, to be decent and forbearing rather than pious, to break down the barriers of class, and to be intolerant of a snob? Men nowadays aim at being comfortable rather than showy in their private dwellings; economical rather than ostentatious in their public buildings. They provide for the wants of the greatest number rather than the luxuries of the few; and therefore they encourage manufactures which mean the diffusion of manual labour rather than

\* A Book on Building, Civil and Ecclesiastical; with the Theory of Domes and of the Great Pyramid; together with a Catalogue of the Sizes of Churches and other large Buildings. By Sir Edmund Beckett, Bart., LL.D., Q.C. (Crosby Lockwood & Co.)



the exclusiveness of artistic workmanship. In Athens and Rome the State was everything,—all the talents were devoted to the “public magnificence,” and the individual was ignored. In feudal times the problem, not inadequately solved, was the harmonising, beneath one head supported by a spiritual power, of several potentates under whose rule communities often lived, and for whom they fought. After a long period of transition, a state of things exactly opposed to that of antiquity is slowly developing in Western Europe; and to-day, comparatively speaking, the individual is everything and the State nothing.

For each individual to masquerade in some discarded fashion of the past is a perfectly legitimate proceeding; but is it compatible with the average good sense of the English people? The novel argument, offensive to poets and some painters, but based on a right foundation and the laws of progress, is that it is better for a thousand inferior families to be able to travel from one prosaic and vulgar centre of business to another,—from one hideous railway station to another—over hundreds of miles of ugly rails, than for ten noble and rich families to travel, each in a state coach and six, with a glittering escort, over winding roads—unkempt but bedecked with natural beauty,—from a city of picturesque gables and spires to ivied castles of towers and battlements. So reasonable, indeed, is the age and country, that if only half a dozen of those thousand families arrayed themselves in the costumes of half a dozen different epochs of history, they would be immediately laughed at as mad or worse than affected. Yet Sir Edmund Beckett—a thinker and a man of the world—treats the recognised difficulty in the following manner:—

“What we want is not a new style, but the genius or taste to build decently in any style. If a new one were invented to-morrow, it would very soon be old, and would be only one more than we have already to choose out of and copy. If the old Gothic builders could make the variety they did with only one style lasting for a century, surely our architects might manage it with half a dozen. Only two things are wanted to produce good architecture: taste, or the power of designing what is pleasing; and practical or scientific knowledge, which is only to be acquired as it is in engineering; which differs from architecture in requiring no taste. One can be taught, but unfortunately the other cannot, though it may be cultivated and improved.”

People who know the principles of the *Builder* will be able to account for the sort of amazement with which we have read and digested this same paragraph; we admit, however, that it may possibly be a defect of our own intelligence which allows us to feel astounded by such words. We are told that good architecture depends partly upon the power of designing what is pleasing. Now, we have stood under the dome of the Taj Mahal and it pleased us; it pleases every one who sees it. The power of designing something exactly similar to it (funds being provided), is undoubtedly possessed by at least a score of English architects; a building of the kind once reared in Hyde Park and kept clean would delight all London. But it would not be architecture, at least in any much higher sense than the figure of Cobbett taking snuff at the Baker-street Bazaar is Mr. Cobbett; or than collegiate hexameters and pentameters are Latin verses. Yet the architectural language of the Taj Mahal is a living one still understood in parts of India. In Hyde Park, however, it would be a foreign one—a style, but not the style, and woefully deficient of style. Nor is practical knowledge the same as scientific knowledge; the latter is a vastly higher and more comprehensive thing. “The two real requirements,” as Sir Edmund has farther put it, “are taste and knowledge.” But he owns to being unable to define “taste,” and he, an advocate, says, “The only test of it is that things in good taste are admired in the long run permanently, and those who have seen them once desire to see them again.” Now taste has been defined, and by practical men. Sir Joshua Reynolds has said that “every object which pleases must give us pleasure upon certain principles.” “The sentiment of taste,” according to M. Viollet-le-Duc, “is, very often, perhaps always, only an involuntary reasoning of which the terms escape.” Taste, as it has been elsewhere put in our pages, is only culture,—the product of example and slow inheritance; and far from our architects wanting “taste, or the power of designing what is pleasing,” as Sir Edmund Beckett describes the æsthetical section of design, superabundance of such “taste” is the rock upon which architectural galleys now split. We admit with him that taste does not

follow education; at least, in its progress it takes a different phase or quality of sentiment. A Parsi woman of good family at the present day is more tasteful in dress and graceful in bearing than her similarly-situated English sister; the actual population of Japan has more artistic feeling than that of England. But the difference in both cases assimilates to that which exists between the youth of a people and their maturer development,—between the imagination of twenty and the judgment of forty years. We have no hesitation in asserting that, at home, taste, in whatever sense the word be taken, has made marvellous progress in the course of a generation. Style is developing. All classes of the people have improved. The age is better in morals, simpler in manners, nobler in aim, than it was even thirty years ago. The very confusion in the arts, which perplexes onlookers, is indicative of movement perpetually going on, accompanied, as it inevitably must be, with all sorts of affectation and exaggerated earnestness.

A few words more on this head. Sir Edmund Beckett affirms that “in the days when there was real architecture there was no architectural philosophy.” We think that there was. Philosophical deduction applied to the arts means nothing more than systematic or methodical criticism. To say, as people did a hundred years ago, and even less, that the “Tuscan style” was intended for garden gateways, the Ionic for summer temples, the Corinthian for ornate edifices, the Gothic for rustic dwellings or country churches, and so on, is neither philosophical, nor critical, nor, indeed, anything at all but caprice, or even worse. But Xenophon’s “Memorabilia” abounds with the reasoning of Socrates in arguments and maxims relating to building and the arts then subservient to it. It would be just as logical and as true to say that in the days of Bacon there was little science, and there were few manufactures. But these things have grown and developed from the English philosopher’s labours and the practical turn he gave to his teaching. That very “eye for defects,” on which Sir Edmund prides himself, has often caused him to philosophise even against his will. “I suppose,” says he, in his definition of an architect, “the nearest approach would be, that he is a man who designs buildings which answer their purpose, and continue to be generally admired.” But in the absence of “a natural good taste” amongst architects, in the general ignorance of the lower classes, and the increasing perplexity of the upper ones, who is to admire? Who is to be the arbiter of admiration? To find out whether anything answers its purpose requires merely mother-wit; but to admire—and for a building to be generally admired it must have a touch of something of art, like that of nature, which makes men akin—appreciation must be based upon reason; and a system of *pros* and *cons.* must be employed to estimate the beauty and utility of its constructive parts. That is the criticism of ordinary common sense, and it may be, and is, refined into a higher one. Indeed, now that all the remains in the world of ancient and mediæval architecture are photographed, and lie at the service of every one for commercial application,—now that the chain of native building traditions is severed, progress and improvement are impossible without some recognised, even though unwritten, laws, to guide men in the work of material creation.

The portion of the book relating to matters of housebuilding contains a great deal of information, interspersed with personal experiences. In discussing the position and “posture” of country houses, our author begins, *suo more*, by describing how “one of the grandest houses in Shropshire was left to the architect to plant as well as to build, who put it, as they often do, to be looked at rather than looked from,—looking north along a sunless valley in a large park, with plenty of fine sites and large views; and that the owner came to see it once after it had advanced too far to stop it, and was so disgusted that he never came again.” Undoubtedly not only too little attention is paid to the planting of a new house, but too much is accorded to the desire that it may be seen from certain points of view, and also to the sentiment inspired by the position of any old one which perhaps it supersedes. Sir Edmund thinks that it is not the north-east, but the south-west face of a house which needs screening from the weather; and trees planted on that side are a sure protection to it. At the same time trees placed too near the walls of a house render them damp, since they exhale damp in rainy weather. Ivy, on the contrary, tends to

keep the wall it covers dry. “I have heard,” he says, “of west rooms which never could be kept dry until they were covered with ivy. . . . I stayed several summers in another house where the library, which ought to be the warmest from its position, always wants a fire three or four weeks earlier than the corresponding east room, and papers become soft and damp after a very little rain, from having been built too near some large trees on the south-west. . . . The owners of country-houses with lodges generally condemn their lodge-keepers to live in houses steeped in damp, and often cut off from the sun by large trees overhanging them.” The plans of a model country-house are also given, and their different portions are very fully examined.

Nor are the details of town-houses passed over without almost equal scrutiny. We were inclined to smile on reading that a covering of concrete, at least 6 in. thick, ought to be placed over the soil, under the basement floor of a house, until we remembered that there is no law to compel such a procedure; and that no ground landlord, in the numerous restrictions he imposes upon the lessees of his land, thinks of inserting a clause which would not only improve his property and impede one of the prolific agents of premature decay, but preserve the health of those who are almost forced to live in the house,—in spite of the damp fumes rising from putrid soil through the lowest flooring. The vexed question of sound and fireproof construction is also alluded to; and, as two or three correspondents have lately interrogated us on the subject, we can here say something about it. In the book we are criticising, mention is made of Sydney Smith, who, in his lectures on moral philosophy, always begged his audience to remember that “when I say a thing is so-and-so, I only mean that I think it is so-and-so;” and in like manner, when people talk about things being proof against the elements, they necessarily use the term in a conventional sense. There is nothing absolutely proof against fire or sound. It is possible to interpose barriers to resist noise; and fire may be interrupted in its course until the natural means of quenching it can be applied, and with sufficient force and endurance. There can be no doubt that through fire in London houses hundreds of lives are periodically sacrificed, two-thirds of which would escape with impunity or slight injury in those of Paris; for the general use of floor-divisions or party-floors composed of rolled iron joists and plaster concrete, to say nothing of oak parquetry, renders this horizontal partition almost equal to a vertical party-wall. But some of the best and the newest houses in the metropolis possess no better barrier between story and story than an inch of lath and plaster and an inch of deal boarding—the space between being hollow, and intercepted only at intervals by joists of inflammable wood. Indeed, to upset a pail of water on the bedroom-floor of a London mansion is to deface the drawing-room ceiling. To prevent this it is necessary to interpose some solid substance; and all solid divisions vibrate, and are more sonorous than hollow ones. In this we can learn much from our neighbours, bearing in mind that plaster of Paris is quarried from their own ground, and consequently cheap; and that we have no alternative but to use Portland or more ordinary cement as a substitute. Even in France, though, a good floor is a costly and complicated piece of business; first, there are the rolled-iron joists to be laid at some 30 in. apart; then, at right angles to them at about 3 ft. apart are placed wrought-iron bars, which are bent at the ends so as to clip the upper flange of the joist and permit the bottom of the bar to be level with the lower flange; and upon these bars, in lines parallel with the joists and of equal length, light iron rods are laid. Under this skeleton a temporary ceiling of planks is propped up; and thereupon concrete of plaster and ballast is composed over the whole floor between the lower and the upper flanges of the joists; and in an incredibly short time afterwards the temporary ceiling can be removed. In very good work the real ceiling is often formed by interstrutting bits of oak into the concrete, and nailing upon them the necessary laths to receive the coat of plaster. The woodwork over is put together with great precaution. Pieces of oak (*lambourdes*) are placed upon the solid filling, and in lines parallel with the joists; these pieces are laid in bitumen, and long channels are thus formed from one end of a room to the other. The oak parquetry (always tongued) is nailed upon the *lambourdes* generally in short slips about 3 in. wide; and in extremely



good work a figured parquetry floor is frequently laid upon a common one of deal. We need hardly urge that such a horizontal partition, for plaster is a non-conductor of heat, is up to a certain pitch a formidable barrier against fire. If, during the real atrocities of the Communists in Paris, some floors and stairs of similar workmanship succumbed after long endurance to the flames, it must not be forgotten that the houses of which they formed part were systematically fired; and flooded previously with oil of petroleum.

As if to show the sort of constructive finish to which the people of this country are accustomed, Sir Edmund Beckett advises as follows:—"Ordinary floors are all the better for the ventilation between the boards, which never remain so close as to be airtight." A French joiner, who does not dream of fixing his parquetry until the plastering is entirely finished, and in a fair way of drying, would be astonished to learn that "unfortunately nailing down a floor over a ceiling is apt to shake it loose." He would be still more astonished to hear that in England parquetry floors consist of squares made up of bits of oak glued together in patterns and sold separately, and then nailed and glued down on a deal floor." We are forced to believe that the author of "A Book on Building" has combined in his "quarter of a century" the experience of Macaulay's two ages. In 1830, the essayist, referring to the buildings then recently erected in London, wrote,—"In a bad age the fate of the public is to be robbed outright; in a good age it is merely to have the dearest and the worst of everything."

A hasty or casual perusal of this book may lead superficial people to think that it is published as a peg on which to hang its author's aversion for architects in general, and one or two in particular. But after a careful examination we are convinced that such a conclusion would be incorrect and unjust; and we commend the book to the thoughtful consideration of all who are interested, or who take an interest, in the building art. The tone in parts is perhaps not quite agreeable, because no one likes either himself or his kind to be held up to scorn; but here is no partial castigator. Duchesses and ladies with "a contempt for the laws of nature," "commercial gents," M. Viollet-le-Duc, who, by the way, is not "the most eminent of the French architects," archdeacons, and rural deans,—all and many others come within the sweep of a vigorous lash. Nor can we omit to state that though a few technical misconceptions and expressions of opinion, founded upon an undeveloped acquaintance with materials and workmanship,—not to speak of some instances of tautology,—do certainly occur, such slight blemishes may be remedied in a second edition, which, we doubt not, is almost immediately inevitable.\* But it is not so easy to rectify generally careless composition. In "A Book on Building" passages such as the following are of frequent occurrence:—"It was never used in real Gothic, except for the roughest kind of walls, or when it was intended to be plastered; which Gothic buildings were a great deal more commonly than is allowed by our architectural prigs and inventors of maxims." "Nearly every country house (which are more spread out, and catch much more water than town ones) catches as much water as its inmates want." "If anybody wants to see what it is liable to become let them look." Sir Edmund Beckett has possibly thought that to "compose" for ordinary every-day use is to waste the time of a practical man; but simplicity and terseness are absolutely necessary to make a technical book readable and popular. The true way of reaching the public ear is to talk distinctly and concisely with plain words and in short carefully-rounded periods. Unfortunately, too many writers,—and our author knows better,—fancy that it is only necessary to cause a clatter in print to make their how to the world, and gain the notice of those they denounce. As a French wit has said,—"On écrit ce que l'on n'ose pas dire;" and one or two very new books, by ladies as well as men, prove the justice of the remark. Yet in the case of a woman, however pretty and accomplished, talking at the sex upon whom nature more than custom has made her

largely dependent; or in that of an amateur architect, however clever and experienced, aspersing the whole building fraternity about the occupation to which they studiously and commercially devote themselves, there is much more to regret than to condemn. For, though rudeness may sooner attract, courtesy holds people longer; and in one respect we are fortunate, since, in assuring a learned baronet of our hearty wishes for the success of his last book, we need use no other language than that of polished men.

#### LEEDS' MUNICIPAL OFFICES COMPETITION.

THE designs submitted in competition for the proposed Municipal Offices at Leeds, and which have been publicly exhibited in the Town-hall, present a higher average of merit than is usual in such cases. They are not, to be sure, very numerous (about three or four and twenty), nor are there many that we positively admire much; but there is a smaller proportion than usual of designs that are manifestly unsuitable or preposterous. This is perhaps partly owing to an influence which at the same time has had in another sense an injurious effect on the character of the designs. The site for the proposed building immediately faces the longer front of the Town-hall, on the other side of Calverley-street, which will divide the two buildings. The competition designs illustrate forcibly the responsibility which attaches to the architect of a great central building in a large town, for they are nearly all influenced more or less by the desire to be in keeping with, in some cases almost to imitate, the Town-hall. We will not be so rude to the architect of the latter as to infer that this result must be entirely disastrous. From one point of view the Leeds Town-hall is admirably in keeping with its neighbourhood; its square heavy masses and absolute uniformity seem the proper culmination of the architecture of Leeds, the dullest (in its modern portions at least) of all large towns, whose wide empty streets and square warehouse-looking buildings oppress the sense of the visitor. But when we see a second edition of this same squareness and heaviness resolved upon, indeed striven after with emulation by various industrious and not untasteful architects, we cannot help wishing that the new building had been further from the Town-hall, so as to have allowed its architect liberty to break through this dominating influence a little. In a more detailed manner we fancy we can trace the influence of the central building upon the new designs in an altogether wrong direction. The plan of the site for the new building is irregular. It is bounded at one end by Centenary-street, and at the other end by Great George-street,—streets returning at a little more than a right angle at each end from Calverley-street; but at the Great George-street end there is a break in the back line of the site, which is narrower here; and this portion of the land is specially purchased for School Board offices, though immediately contiguous to the portion devoted to ordinary municipal offices. According to the natural principle of designing buildings, there is, of course, a direct suggestion here for a variety of treatment, by giving to the School Board portion, which is completely isolated in plan from the rest, a special and separate character. But the architectural atmosphere of the neighbourhood is conventional; the Town-hall is absolutely uniform, consequently it seems to be taken for granted that the new building must also be uniform; and so every one of the competitors, without exception, has thrown away this obvious "lead" towards a varied and more or less picturesque combination, and has laboriously masked the two departments behind an absolutely symmetrical screen, in nearly all cases with a more or less heavy effect, in some cases with absolutely injurious results on the plan, which might have been easily avoided,—which there was every reason in the condition of the building for avoiding,—if only they would have gone to work the natural and not the artificial way.

The municipal portion of the building was to provide, according to the conditions, a principal floor, accommodating the borough engineer's department, the main offices of the gas and water departments, and the public accountant's office; a ground floor, or raised basement, accommodating the lamps, highways, and police departments, and some subsidiary offices of the gas

and water departments; and a second floor, devoted to a public reference library, lending library, and reading-rooms. It will thus be seen that while the conditions suggest a sub-division vertically into School Board and municipal sections, which, as we have said, has been ignored by all competitors, they suggest vertically a principal story predominant over the rest, and a library story which might give occasion for special treatment.

In the first premiated design, "Crayon" (Mr. Corson), the principal floor is duly emphasised by large arched windows, with an "order" between them on the wings and centre; a rusticated podium, pierced with windows for the ground-floor, forms the basis to the principal floor, and a strongly marked cornice crowns it, carried all round the three principal fronts; over this cornice comes the library department, as a rather large and heavy attic, with flat slated pilasters and a balustrade over, with the usual style of flower-pot finials. There is not an original feature or idea in the whole; but the author treats the stock-in-trade properties of "Italian" design with knowledge and good taste, as far as they go; and from a Leeds point of view (perhaps we should say, "a Leeds-Town-hall point of view") there is not much complaint to make in regard to the selection on architectural grounds: it is certainly the best plan out of the eight selected ones; and, though a most heavy and uninteresting building, does not sin against good taste or common sense. The roof forms, of course, no part of the design, except in so far as regards five convex-lined Mansards, a large one crowning the centre feature over the principal entrance, and four others on the angles of the wings, and we hope added to the drawing as afterthoughts, as they have not the slightest relation to the sub-structure, and look very awkward and unmeaning; but this, we suppose, will be modified before the building is carried out. The first paragraph of the architect's report confirms curiously what we had said above as to the influence of the Town-hall upon the designs. "I determined," he says, "that the new buildings adjacent to the Town-hall should be similar in style to the Town-hall, but not identical in treatment. I think that a certain extent of variation from that building would be to the advantage of the effect of both"; so that it appears that Mr. Corson regarded the notion of actually copying the Town-hall as by no means out of the question, but on the whole undesirable! The plan of the building, without aiming at "points," is very simple, compact, and practical. The accountant's public office is near the principal central entrance, which gives access also to the main corridor running parallel to Calverley-street, and returning parallel to Centenary-street,—a type of corridor arrangement followed by the greater portion of the competitors. The central portion of the site is occupied by an open court, also parallel to Calverley-street, for light and access to the basement offices, across which the back block of building, containing the main portion of the water offices, can be reached by a bridge in a direct line from the main entrance, as well as by the return corridor at the Centenary-street end. As nearly all the competitors have this open court in pretty nearly the same position, though varying very much in extent, and a large proportion show the bridge over it, we presume there has been official suggestion in this matter. The corridors will be fairly, but hardly amply lighted; the library stairs are kept, as they should be, quite unconnected from the business part of the building, and have a separate entrance from Centenary-street; the library floor is very well arranged, with two corridors marked "Reference Library" and "Lending Library," leading at right angles from the main staircase to the two departments; the reference library occupies the central space in the front block, and the lending library the long narrow block in the rear. The space for the public in the lending library counter-room is awkwardly shaped, and might be improved. The author provides a mezzanine story next the inner court, not suggested in the conditions, but really the only practical way of utilising space in a collection of rooms of such different sizes (several of the competitors adopt the same course). The School Board buildings are carefully planned in regard to the provision of staircases for each of the classes of persons who have to use the buildings in connexion with the Board-room, architect's office, and large examination-room; this latter, which has proved a difficulty in some

\* At p. 87 of the book, some remarks on the "destruction of plaster" in churches are said to have been delivered at Northampton by Sir Gilbert Scott, R.A.,—remarks opposed to his recently-published utterances. They form, however, part of an excellent paper read before a Lincoln Society by Mr. G. G. Scott, M.A.,—an architect, and a son of the former.



of the plans, the architect treats as a long room parallel to the Great George-street front, a break in which naturally suggests the opportunity of a provision for temporarily dividing the room into two portions here when desired. As to the cost, Mr. Cockerell, the referee, has already expressed his opinion that the committee's estimate of 60,000*l.* for the whole buildings is too small for any satisfactory structure, and we cannot think Mr. Corson's would come within the sum; but it is by no means one of the most extravagant of the set.

Of the other eight designs selected by the committee for special consideration, that placed next in order of merit is "Hoc Securior," a design with a large Corinthian order of three-quarter columns carried through two stories, and exhibited in a beautifully executed pen-perspective of admirable freedom and boldness of execution, which seems to have carried away the (presumably) cooler judgment of the referee, as well as that of the committee; for, in spite of the fine drawing, the design is faulty to a degree, if considered in regard to the true basis of architectural treatment. The principal story is not emphasised at all; the ornamental details are in most meretricious taste,—

Quips and cranks and wreathed pots,  
Garlands twined in wanton knots

(to "adapt" Milton a little): and the wings are crowned each with a lofty and heavily-built-up pedimental erection, picturesquely conceived, but without a shadow of excuse in the roofing (no roof is shown at all), mere masses of stone piled up to tell a falsehood. This is the kind of thing that makes the study of a set of competition drawings such a melancholy task. We fancied such flagrant falsities of design as this were now universally condemned, but here we find them all flourishing as lively as ever, and an able professional referee praising them. The plan is adequate in general, but the library staircase is mixed up with the business traffic of the building in what would prove a very inconvenient manner.

"Spero" (Messrs. Hill & Swann, of Leeds)\* looks well in elevation, but not in perspective, the large order running through two stories having the cornice, blocking, and everything broken round the top of each column, so as to cut up the design, when considered in perspective, into a series of vertical lines. This is in the wings only; the recessed portions are much better treated, with no "order," only large windows, with semicircular-headed panels over them, filled with sculpture; this portion, we admit, seems out of keeping with the wings, which is perhaps the meaning of the referee's rather ambiguous statement that it is wanting in "sufficient appreciation of scale." The plan is up to the mark; the corridors are rather wasteful of space, and we may remark on the curious anti-climax shown in this and other plans, in leading a broad corridor and bridge straight across from the principal entrance, to end only in a narrow passage, and the window of the sample-room of the water-department. Corridors should have a relation, in size and position, to their object, so that the plan may tell its tale at once. (The entire want of subordination in this respect is one of the great faults of the Town-hall, where any door may lead anywhere—or nowhere.) The library entrance and staircase are sufficiently separate, but the library floor is badly planned: see the position of book-binding and store rooms close on the principal stair, and with no subordinate stair or lift; and the lavatories so placed as to have a raking fire from the counter of the lending library. The examination-room in the School Board Department is very awkwardly shaped.

"Plato" (Mr. W. Bakewell): a capital design, for a warehouse. It is not apparent why the author adopts the Greek philosopher's name as his motto, for his building is farther from Greek reminiscences than most of them; it is an oblong block of building, in which the effect is entirely obtained by fenestration and either tiled or carved ornament (it is not very apparent which) in panels, the treatment being flat in general effect; there is a balustrade railing over the cornice, but the roof is frankly shown,—in fact, predominates too much, being all on one level, and unbroken except by dormers which do not rise as high as the ridge. The principal entrance is marked by a kind of projecting canopy, which is the only break in the squareness of the whole. There is a simplicity and honesty of treatment about this design, but it is greatly

wanting in dignity and effect: the plan has very defective points, the library entrance and staircase are badly managed; space is wasted in the passages; and, at the Great George-street end, the obtuse angle of the street has been followed, while the difficulties entailed by this choice have been shirked: the examination-room thus becomes an irregularly-shaped trapezium, and the author does not show how he proposes to accommodate the design of its large roof principals to the varying width. It is difficult to account for the position of this design in the competition.

"L. P. O.": a Palladian design; rusticated basement, Corinthian columns and pilasters through two stories, with windows of no very particular character between, neither story predominating; no roof is shown, but *en revanche* the architect has utilised the regulation terminal vases on the balustrade as chimneys, and takes care to tell us that those which are not used as chimneys are made to resemble the others. There is something poetic in the idea of these smoking vases, recalling the celebrated pot in the story of the "Fisherman and the Genie" in the "Arabian Nights." The plans were hung too high to be very well studied; they seem good, and with well-lighted corridors, &c., the design seems to have even less reference to the plan than usual. There is something in the way in which the entrance-door at one side of the principal portico is balanced by a corner window of the engineer's office, and a centre door is contrived opening on to a blank wall,—all for the sake of symmetry,—which is refreshing, and takes us back to the days of our youth. There is a certain sort of old-fashioned good taste about the exterior, and it looks well in perspective, but we cannot go back to that sort of thing now.

"Nota bene" (Messrs. Adams & Kelly, Leeds) is a design with a good deal of merit, in what might be termed the French *hôtel-de-ville* style, a free Renaissance, producing, in fact, rather a Gothic effect *en masse*. It looks less well in perspective, from the design when so seen cutting up into vertical segments too much, and there is not breadth and solidity enough in the treatment to bear carrying over so large a block of building. If the authors, instead of aiming at this unbroken mass, would have broken up the building, as we have already said the site suggests, they could have made a much more pleasing design with nearly the same materials; as it is, they have got picturesque detail grouped in an unpicturesque manner. The library entrance is not well managed, and seems jumbled up with the sanitary department (perhaps on the principle of securing *mens sana in corpore sano*), but in other respects the plan seems a much better one than some others that are placed ahead of it, and makes the most of the space. The amount of elaborate stonework would render it, however, a very expensive design.

Of the other two designs included among the eight, "Leodiensis" and "Q. E. D.," it is scarcely necessary to speak particularly, as they have not the slightest claim to selection on their merits; in the latter the architectural detail is simply what might be described as "flummery," and that of the most puerile description. That such a design should have been among the selected eight is little less than an insult to the authors of some of those not so selected, and the fact proves at least the utter incapacity of the committee to form a judgment on architectural design.

Passing to some of those which have not had the good fortune to fascinate the committee, we notice (taking them in the order of hanging) a very nice and refined design under the title of "Spes," by Messrs. Bell & Roper, of Manchester. This is a design of Jacobean type, treated with some originality; the principal floor lighted by large round-headed windows, with mullion and transom frames, between a kind of compound buttress, the lower part a flat projection with a niche and statue and finished by a little curved pediment, on which stand light coupled columns, which rise to the main cornice, cutting through the second-floor string line. The whole is very elegant and well considered, and, moreover, economical; nor do there seem to be any serious defects in the plan, though it is not equal to some others. The perspective view, lightly tinted in Indian ink, is a very nice drawing, and the whole set very meritorious.

"Leodiensis," judging from a letter we saw in one of the local papers, considers himself an ill-used man; and (though that is, of course, the normal state of mind of unsuccessful com-

petitors), we are rather disposed to agree with him. His plan will not bear very close examination; the library floor is ill-planned, or hardly planned at all; there is insufficient staircase accommodation, and what there is is not well placed, and there are other weak points, but also some good ones. The architectural treatment appears to us to be among the most pleasing of all the designs exhibited, though not shown in such able or effective drawings as some others; it is Early Italian Renaissance, with two orders and a cornice between, and windows between the columns; the roofs are made part of the design and effectively treated; behind the centre pediment is a rather graceful, though not very original, tower. The author carries a mezzanine over nearly the whole of his principal floor, which is cleverly worked into the fenestration of the design so as to indicate it as a separate story: in taking this course he has, however, injured his principal story, perhaps practically, certainly architecturally, depriving the design of some dignity and of subordination of effect. This is, however, a much more logically designed building in relation to its contents than the formal structures with one big order which we have noticed; and it is a more pleasing structure, as a matter of architectural effect and grouping, than the first premiated design: but then it is not so practical in other senses; the tower means nothing, for instance, and is actually in the way in the library plan, and the detailed treatment of design and plan may argue a want of experience. Still, we think the author of this design deserves more credit than he seems to have got.

"Harmony" (Messrs. Alexander & Henman, Stockton-on-Tees) is a very ambitious and very able set of drawings, completely beyond the mark in cost. A large order of square pilasters is carried through two stories, from a heavy rusticated basement, with the two ranges of windows between,—the lower circular-headed, the upper smaller and square-headed. The perspective view, a fine sepia drawing, has a powerful effect. The plan is not bad, but has defects: imperfectly-lighted corridors, and the library-entrance confusedly planned. It is no use stating on a plan that a particular entrance is for such a department alone: the plan itself ought to render any other supposition impossible, or it is faulty. But this is a design showing considerable talent and spirit, and first-rate draughtsmanship. The authors add a large detail drawing.

"Utility" is a design hardly corresponding to its title (designs labelled "utility" seldom do), as its only noticeable point is a rather effective treatment of a central and subordinate cupolas, which have no obvious use.

"Omne Verum" (Mr. Mason & Mr. Powell, London) is one of the few designs which attempt what we should regard as a matter of course, viz., a characteristic treatment of the library portion. The principal story has an order of columns with pedimented windows between, carrying a strongly-marked cornice, over which the library story is treated without windows, with flat fluted pilasters and panels, with central ornaments on the wall between. No roofs are shown, and the long unbroken line of parapet adds to the heaviness of the upper story, which overweights the lower portion somewhat; but this might be modified without affecting the character of the design, and the attempt is meritorious. The plan has defects, but not of the most serious nature.

"Comme il faut" (Messrs. Holtom & Connon, Leeds) shows some originality of treatment, but is wanting in refinement; the plan has the merit of well-lighted corridors. The same architects exhibit a Gothic design (the only one) under the motto "*Finis coronat Opus*," an application of Geometric Gothic in which a certain municipal type is achieved, with no special originality: the perspective view is a good drawing, but the design is hardly suited to the site, and the tower which is introduced is absolutely without motive or excuse on the plan; it develops from nothing, and in architectural design *ex nihilo nihil fit*.

"*Pro rege et grege*" (Mr. E. R. Robson): one of the cleverest designs in the room; in saying which we by no means commit ourselves to admiring it. From the coloring it is apparently a brick building, of the most pronounced "Queen Anne" type, but treated in a manner which realises something very like absolute originality from an exceedingly ingenious combination of mongrel details. On a plain basement, with a balustrade-like wooden stair-rails in front, comes a

\* We give the names of authors where they had been appended to the drawings, which was not the case with all.



range of flat pilasters fluted at the upper part, the flutes stopping at the impost level of the semi-circular-headed windows between them. A light cornice with a Greek key pattern as frieze comes over this, above which the library story is here again treated characteristically as a windowless wall, relieved occasionally by a slight projection, finishing in a curved pediment, or by "pots" placed over the pilasters where the upper wall falls back sufficiently to allow space for them. Square masses, presumably chimneys and ventilators, rise at intervals from the cornice, with "stair-balusters" between, and the wall is further decorated by terra-cotta festoons, introduced as if looped along under the cornice. A centre erection, with extraordinary pepper-pot angle turrets, breaks the line of roof. Except this and the festoons (which look simply silly) there is, with all its oddity, a remarkable absence of commonplace or vulgarity in the design (which is further illustrated by a fine detail drawing); and the plan is an admirable one, about the most compact in the collection. This is also almost the only one, as far as we noted, which attempts giving any character and style to the inner elevations towards the centre court; in most cases these are just left in a hole-in-the-wall state, while all the "style" is concentrated on the exterior,—a vicious, but nearly universal practice. Many would probably think this design ugly (we should possibly be of the number), but no one who understands the matter can question its ability. That a set of drawings like this should have been left out of the running in favour of some among the chosen eight is almost laughable, unless we are to attribute the selection to something else than mere ignorance.\*

"S. P. Q. L." we take to be the work of a young designer; it wants refinement and restraint; but there is a good deal that is really clever about it. The author has thought for himself, and has aimed at treating the buildings in a characteristic and effective manner; nor has he failed in doing so, but he has not succeeded in uniting the whole into a homogeneous conception. The plan is rather effective than practical; but the author has ideas.

"The Bride Elect" under this high-sounding title Messrs. Caws & Eltringham (Sunderland), embody their ideas in a very ambitious and showy design of Roman type, with a large order through both stories, a big dome in the centre, and cupolas on the roofs of the wings, treated in a somewhat original manner. There is effectiveness of a theatrical description in the design.

"Argos" shows a pretty Indian ink perspective of a nicely proportioned and balanced facade, also of Roman proclivities; the general effect is tasteful of its kind, but the design will not bear criticism in detail.

"Alps" (Messrs. Hornblower & Son, Liverpool) is a plan in which the authors have sacrificed real convenience of arrangement to the ignis fatuus of an apparent symmetry and effectiveness of plan; entrances are made at each angle of the front, leading to a circular lobby in the centre of each wing, carried up and ending in a cupola on the roof. The arrangement is very good at the business end, where the circular space might form a sort of ventilating shaft to this portion, and the library stairs wind round it; but it is very different at the School Board end, where the arrangement leads to awkward angles and corners, and the circular shaft cuts through the centre of the examination-room in a way that is preposterous, and would in itself condemn the plan. The design is a nice one, but somewhat weak in detail, and not drawn in a style to make the best of its effect: there are symptoms, however, of want of time, and consequent hurry in the drawings; but we have seen much better things with the same names to them.

"Felix" (Mr. H. L. Florence), is a very clever and original design, by no means unsuitable for its position. It is "Classic, freely treated," with rusticated pilasters and circular-headed windows between, in the centre portion, and larger circular windows in the wings filling up the space to the main cornice; in the centre portion, the wall above the windows and pilas-

ters, which carry a light sub-cornice, is filled up with panelling. Above the cornice are semi-circular dormers, piquantly but not quite satisfactorily treated. The roofs form part of the design. The plan presents nothing special for comment,—the examination-room is treated in an effective manner,—but as a specimen of some novelty of style and treatment this design merits mention.

Some few others, which have no special point for commendation, we pass over it. As a whole, the designs were an interesting set, and showed here and there an unusual degree of cleverness, unfortunately thrown away. It is much to be regretted that some good designs have been thrown out of court, and that the real advantage of calling in a professional referee has been to a great extent nullified by the committee anticipating part of his office; in their mode of doing which, however, they must have the credit of having evinced a laudable spirit of Christian charity and brotherly feeling towards their fellow-townsmen among the competitors.

#### THE GIBSON GALLERY.

RATHER tardily the Gallery required by Gibson for the reception of his works, as a condition of their bequest to the Royal Academy, has been completed, and was opened to the public on Monday last. The first impression of most visitors will probably be the same as our own: that the room is not large enough for the works collected in it. They are crowded together in a manner which confuses the eye, and in every sense, practically as well as aesthetically, quite precludes an abstracted contemplation of any one work. The small bas-reliefs are too high above the eye to be well seen, and the colossal Mars, which is placed in the centre of one side of the room, cannot be seen in front view from any point sufficiently distant to take it in at the proper angle. In other respects the room falls short of what we might have expected, and very far short of what might have been done. It is simply an oblong apartment, with walls coloured a deep red, a rather commonplace tiled floor, and good wood fittings (doors, architraves, and skirting), in rather handsome style. Around this room are ranged the works, marble and plaster, on sham marble pedestals of different heights, tints, and sizes, in most admired disorder; and the bas-reliefs in plain wooden frames or brackets against the wall above. The lighting is good, and the general colouring of the room such as not to distract the eye. But there is not the faintest attempt to design a room suited to the particular works which it was to contain, or to give any effectiveness of arrangement or background to the statues. They convey the idea of being miscellaneous works sent for temporary exhibition, and therefore necessarily crowded and on miscellaneous-looking pedestals. In the sculpture-room of the annual Academy exhibitions this heterogeneous kind of jumble, however one may regret its effect on the works, cannot be helped, as no one knows beforehand what will be sent. But here was a collection of designs which have long been in the hands of the body to whom they were bequeathed, which therefore might be perfectly well classified; the precise size and shape of each, and the space it would occupy, were known; and yet, in planning a room on purpose for them, not the slightest special arrangement has been made for them, not the slightest appearance of the room having been designed for these particular works: an oblong room has been built and the statues put round it to take their chance, the only special treatment to which the mind of the Royal Academy has soared being apparently the provision of pedestals of two or three different heights and of two different tints of marbling. We venture to say it was not this kind of gallery that Gibson contemplated when he made his bequest.

It may be replied that economy has been the stumbling-block to the provision of a more suitable gallery; and that argument, unanswerable from a certain point of view, it is not, at all events, our business to answer. Apart from that, it is not difficult to see how the Gibson statues might have been far better placed than they are. One or two arrangements suggest themselves at once. The gallery might have been planned in two comparatively lofty compartments, in one of which the large works in marble could have had place, and in the other those in plaster, so as not to injure the effect of the latter so much by bringing them into immediate contiguity with

the finer material. There should have been nothing so paltry as irregularly-shaped pedestals of sham marble placed against the wall, but a continuous stone dais or podium round the sides, which might have been architecturally designed so as to give the varying heights required, by foresight and not by accident. It might be impossible, and would probably be undesirable, to place all the statues in niches, but for those which seemed most to require such a framing niches might have been formed, which, occurring at intervals in the wall, would have given a motive for the architectural design. Between these two imaginary chambers might have been a lower one, the vestibule to both, on the walls of which, not stuck about irregularly, but in panels specially designed for them, the smaller bas-reliefs could have been arranged. Or another principle might have been to have a longer room, to arrange the large works along one side of it, the marble ones in niches and connected with the architectural design, the plaster ones standing separately; the spectator placed under a lower ceiling with no light through it, and looking through a low range of columns at the statues: thus the disagreeable effect of the top-light would be kept from the spectator's eyes. The bas-reliefs might have gone on the wall behind the colonnade, with a special light provided for them, which could easily be done. In both the supposed cases the works on a small scale would be separated from those on a large scale, and the marble works differentiated from the plaster. Surely it would have been worth while for the central Art Society of the nation, with all its wealth and prestige, to have taken the opportunity of making some little attempt to solve the problem of a successful sculpture gallery, under the peculiarly advantageous circumstances of knowing exactly the limit of what they had to provide for.

That the present room is not such as Gibson contemplated may perhaps suggest the reply that the importance of the gift was exaggerated in his own eyes; that he had over-rated his own place in art, as his own friends and admirers, and the public in general, in fact, certainly did over-rate it at one time. At the time of his death, Gibson's fame had been a good deal questioned and weakened in this country; partly, perhaps, owing to the unfortunate turn which he took towards tinted statuary; an idea which, as he applied it, has never won the suffrages of the most thoughtful critics. Apart from this, too, he had come to be regarded, in a society no longer satisfied with Classic ideals, as a mere modern reproducer of Greek art. It is known that he himself held the maxim that the Greeks could do no wrong in art; so that when the idea was promulgated that Greek statuary was coloured, Gibson did not think of asking "Were the Greeks right in doing this?" but immediately adopted the conclusion, "This is right, because the Greeks did it"—of course a mere begging of the question. But it is gratifying to feel that, in contemplating Gibson's collected works and casts, even under the disadvantageous circumstances we have described, the result is to bring us back to the conclusion that the sculptor's fame has a more solid basis than has recently been allowed; that the limits of his ideal in the art were less narrow than we have permitted ourselves to think. Gibson's latest works were not his best, it must be admitted; his "Venus," even (as it is in the Academy collection) without the objectionable tinting, adds nothing either in finish of modelling and perfection of bodily form, or in artistic conception, to what other sculptors, ancient and modern, have given us as the ideal of the goddess of beauty. His tinted "Hebe," with the blue eyes and unimpassioned features, which was exhibited at one of the winter loan exhibitions, is disagreeably doll-like, although the arms and hands are beautifully modelled. The tinted marble loses its characteristic crystalline surface, and reminds us of the soapy-looking jade in which Indian carving is often executed. But other classicities are not so devoid of life and character as these. His "Paris" holding the apple, the easy voluptuousness of the figure heightened by the peculiar head-dress, half-womanish in appearance, is a fine epitome of a legendary character. Much thought has preceded the modelling here; and the same impression is created by the figure of the wounded Amazon, and the serious concern of her countenance as she raises her skirt to examine the wound; there is a certain realism rather than mere "antique" style here. There is the same sort of realising intensity in the conception of Bacchus, the large marble figure carrying the

\* The author of this design, Mr. Robson, is the salaried architect of the London School Board, and we are called on to inquire whether or not these drawings have been prepared with the assistance of the staff provided for Mr. Robson at the public expense. This we do with some hesitancy. Correspondents suggest that Mr. Robson ought to have quite enough to do in the proper discharge of his public duties without competing with his less favoured contemporaries.



Thyrus, and which is rather Asiatic than Greek in its full contours: this is a work, if we mistake not, less known than a good many of the sculptor's productions. In this, and the "Cupid and Butterfly" that stands next to it, as well as in the better-known "Narcissus" (the first thing popularised as a statuette by the Art-Union of London), Gibson adopts a type of head and of hair which we are familiar with in the Greek figures of Thorwaldsen; a rounder face and fuller and more luxuriant hair than belong to the most usually accepted antique Greek type. The head of the "Narcissus" in this edition of the figure (which Gibson executed repetitions of, as he did of other works) is beautifully finished. But superior to any of these in conception and attitude is the "Sleeping Shepherd," of which the model only is in this collection, and which is a more poetic conception than most. We have the model, too, of the "Hylas and Nymphs," of which the National Gallery has the marble, where it is placed so that no one can properly see it. We have always been disposed to think this Gibson's finest work; the Nymph on the left of the spectator could hardly be surpassed for grace of line and movement in the long shapely limbs and beautiful (one might say "aristocratic") turn of the neck and head.

Much of the bas-reliefs some remind one a little too much of Flaxman, to the advantage of the latter: "Phaëton trying to drive the Horses of the Sun," however, is a composition of great spirit and beauty. The companion work, "The Hours leading the Horses of the Sun," is, in the action of the figures, too strongly reminiscent of Guido's "Aurora." But what pleases and at the same time vexes one a little in the bas-reliefs, is the evidence some of them give of Gibson's power of treating subjects of purely human interest, with the pathos and feeling of modern life. It is vexing, because one cannot help feeling he might have been better employed on more of such works, than in turning out replicas of "classic" figures. Indeed, some of the latter half unconsciously take a form capable of a modern rendering. A plaster figure of "Venus and Cupid," life-size, for instance, where the goddess raises the little boy to kiss him, might as well be called "Mother and Child": and why not? Surely as large and universal a subject. But in some of the bas-reliefs Gibson seems to show a peculiar felicity in handling subjects in connexion with real life, and bringing them into the domain of purely sculptural art. The monumental figure of "Mrs. Henry Sandbach," for instance, in low relief, but with the head slightly turned so as to come out in higher relief, is beautiful: the expression and pose are perfectly real and unforced; the hands rest one over another in the most natural and expressive attitude; the drapery is so closely assimilated to modern costume as to seem quite in keeping with realism; yet the whole falls into the most pure and sculptural pose and lines, so that the claims of feeling and of artistic propriety seem perfectly balanced and satisfied. There is the like kind of excellence, the like seriousness of expression, combined with sculptural breadth of treatment, in the portrait bas-relief of "Mr. William Earle." These portraits, and one or two busts in the collection, are those of members of families whose names have been long connected with Liverpool, in which town Gibson found his first encouragement, was brought up, and whence he set out, with the help of appreciative friends, for Rome. His larger portrait statues are less successful, because more mannered. In them he adhered to the "blanket" style of drapery which recent taste has wisely discarded in the representation of men of the present day; in the smaller bas-reliefs he seemed to have felt more at liberty to break through conventionality. If the collection cannot be looked at with all the interest and enthusiasm which the genius of Gibson was once supposed able to command, it is well worth while to go up the stairs at Burlington House, and revive impressions of his works in this collective form; we only wish they were placed in a manner more advantageous to their effect.

**Projected Tramways.**—The Clerk of the Islington Vestry has received preliminary notices with reference to further tramways in that parish. One line is in Holloway-road, St. Paul's-road, Canonbury-road, Canonbury-square, Essex-road, New North-road, and Balla Pond-road. Another line would be in Caledonia-road, and Camden-road.

#### ON THE CHIEF SYSTEMS OF SEWAGE DISPOSAL NOW IN OPERATION.

THE attention of the Local Government Board having been directed to the great difficulties experienced by sanitary authorities in devising means for the disposal of the sewage of their districts; and, having regard to the frequent applications which are made to them for advice on this subject, deemed it expedient that special inquiry should be made under their direction into the practical efficiency of the chief systems of sewage disposal now in operation, and for which loans have been sanctioned by them.

So they appointed Mr. C. S. Read, M.P., one of their secretaries, and Mr. Robert Rawlinson, C.B., their chief engineering inspector, in conjunction with Mr. Smith, the secretary to the late Rivers Pollution Commission, as their assistant, to visit a limited number of localities in which the processes in question are in operation, and report fully thereon to the Board.

These gentlemen accordingly visited Edinburgh, Wrexham, Chorley, Blackburn, Doncaster, Harrogate, Wolverhampton, Leamington, Warwick, Rugby, Banbury, Bedford, Croydon, Norwood, Reigate, Worthing, Aldershot, Romford, Tunbridge Wells, Cheltenham, Merthyr-Tydfil, Barking, Norwich, and Enfield; Kendal, where the downward intermittent principle is carried out; Leeds, Bolton, Coventry, Tottenham, Edmonton, and Hertford, where sewage is treated by a chemical process; Bradford, Birmingham, and Luton, where sewage-sludge is precipitated by the addition of lime; and Halifax, Rochdale, Salford, and Manchester, where the pail system is partially used for dealing with excreta. They also visited Leyden and Amsterdam, where the pneumatic system is partially in operation; Paris, where only a portion of the sewage is utilised in irrigation; and Brussels and Berlin, where the sewage is about to be disposed of in irrigation, and their report is just now issued,\* and contains the following

#### Conclusions.

"1. That the scavenging, sewerage, and cleansing of towns are necessary for comfort and health; and that, in all cases, these operations involve questions of how to remove the refuse of towns in the safest manner and at the least expense to the ratepayers.

2. That the retention for any lengthened period of refuse and excreta in privy-cesspits, or in cesspools, or at stables, cowsheds, slaughter-houses, or other places in the midst of towns, must be utterly condemned; and that none of the (so-called) dry-earth or pail systems, or improved privies, can be approved, other than as palliatives for cesspit-middens, because the excreta is liable to be a nuisance during the period of its retention, and a cause of nuisance in its removal; and, moreover, when removed leaves the crude sewage, unless otherwise dealt with by filtration through land, to pollute any watercourse or river into which such sewage may flow. We have no desire, however, to condemn the dry-earth or pail systems for detached houses, or for public institutions in the country, or for villages, provided the system adopted is carefully carried out.

3. That the sewerage of towns and the draining of houses must be considered a prime necessity under all conditions and circumstances, so that the sub-soil water may be lowered in wet districts, and may be preserved from pollution, and that waste-water may be removed from houses without delay; and, that the surfaces and channels of streets, yards, and courts may be preserved clean.

4. That most rivers and streams are polluted by a discharge into them of crude sewage, which practice is highly objectionable.

5. That as far as we have been able to ascertain, none of the existing modes of treating town-sewage by deposition and by chemicals in tanks appear to effect much change beyond the separation of the solids, and the clarification of the liquid. That the treatment of sewage in this manner, however, effects a considerable improvement, and, when carried to its greatest perfection, may in some cases be accepted.

6. That so far as our examinations extend, none of the manufactured manures made by manipulating town refuse, with or without chemicals, pay the contingent costs of such modes of treatment; neither has any mode of

dealing separately with excreta, so as to defray the cost of collection and preparation by a sale of the manure, been brought under our notice.

7. That town-sewage can best and most cheaply be disposed of and purified by the process of land irrigation for agricultural purposes, where local conditions are favourable to its application; but that the chemical value of sewage is greatly reduced to the farmer by the fact that it must be disposed of day by day throughout the entire year, and that its volume is generally greatest when it is of the least service to the land.

8. That land irrigation is not practicable in all cases; and, therefore, other modes of dealing with sewage must be allowed.

9. That towns situate on the sea-coast, or on tidal estuaries, may be allowed to turn sewage into the sea or estuary, below the line of low-water, provided no nuisance is caused; and that such a mode of getting rid of sewage may be allowed and justified on the score of economy."

The statements of the Commissioners accord so nearly with the views which have been set forth and urged in this journal that little comment will be necessary. We shall content ourselves with giving the pith of the more important parts of the Report, commending the whole, with its appendices, to the serious attention of all who are interested in the subject.

With respect to the laboratory value of town refuse and of sewage, or of the manipulated solids of sewage, they have not found a single case where it is sold at a profit; and, as a consequence, there have been local disappointment and accumulations of several thousands of tons of manufactured manure, asserted to be worth from one to several pounds sterling per ton, which prices are not realised; consequently there are these vast heaps encumbering the premises where manipulated. In the case of town sewage, its unceasing flow and the great volume of water to be disposed of day by day detract from the undoubted manurial value which there is in it, so that sewage containing ammonia, representing a manurial value of 2d. per ton, has to be given away, or has to be wasted into the sea. With respect to the solid manure made from town refuse and extracted from sewage, its bulk and weight reduce its value, and as, like sewage, the production goes on all the year round, it must be heaped up until farmers can be induced to remove it,—the inducement for them to do so being a price far below the cost of production.

**Town Scavenging.**—Town refuse, both fluid and solid, must be got rid of, and the more completely and rapidly the process is effected the better will it be for the inhabitants. The cost of any process should, however, be a secondary question,—always provided that due skill has been and is used in devising the local works, and proper care has been and is exercised in supervision and labour.

**Sewage not Profitable to the Extent estimated.**—In 100 tons (224,000 gallons) of sewage, having the equivalent of eight grains of ammonia to the gallon, the ingredients are estimated as having a manurial value of 17s. 7d. The suspended matter, which will subside when at rest, or which chemicals will assist to precipitate, is worth 2s. 2½d.; other dissolved matter which remains in the clarified water being worth 15s. 4½d. This makes the value 21 penny per ton, or say 2d. per ton; the Royal Commission (1853 to 1865) accepting this estimate of 2d. per ton after a set of exhaustive experiments fully recorded in their three Reports, came to the conclusion that a farmer having to take and dispose of sewage day by day, all the year round, would not give more than a ½d. per ton, if even this could be afforded. An examination of the abstracts in this Report will show that sewage has very generally been used in irrigation at a loss. Although this estimate appears so favourable, we find that it fails to be commercially productive in practice, and we may repeat that no chemical or other treatment of town sewage with which we are acquainted is a commercial success. The suspended solids may be precipitated, and the sewage so far clarified by these processes; but the sewage is not purified, nor does the sludge appear to be increased in value as a manure so as to command a sale sufficient to pay the costs of production. The pail system, as practised at Rochdale and other places, does not produce a solid manure of sufficient value to repay the contingent expenses, and command a ready sale.

**Sewage not to be stored in Cesspools.**—Sewage should not be stored in cesspools beneath houses, or near to houses within a town; neither should it be allowed to rest stagnant in badly formed,



sewers, nor, indeed, in any sewers; but all waste water and excreta should pass to the drains unperceived, and should then flow in an unceasing stream; and, if practicable, at once over and through land properly prepared for its reception and agricultural use.

**Mechanical Power of Water.**—Water is a purifier, a cleanser, a dissolver, and a mechanical power, and will carry along down an incline the solid ingredients of town sewage, with road detritus,—such as grit and silt; the moving power of water being in proportion to the volume, the vertical depth, and the gradient down which the flow is directed. Flushing by volume and head, artificially formed, will remove detritus from sewers of low gradients where accumulation may have taken place. A velocity in the sewage of 2 ft. 6 in. per second will remove any solids likely to be passed into drains and sewers.

**Sewage Irrigation proved not to be Injurious to Health.**—There is no record of any special outbreak of disease at or near the sewage farm. The men working on the land and amongst the sewage are reported to be healthy, the men cutting the grass are healthy, and the cows fed upon the grass are also as healthy as other cows, producing wholesome milk; and with respect to tapeworm, the medical men who attend the Edinburgh hospitals do not find any exceptional excess of this disease amongst their cases; but, on the contrary, less than in other hospitals. The Craighentilly meadows were made the subject of an exhaustive inquiry by the War Department during the time that Lord Macaulay was member for Edinburgh and Parliamentary secretary for that department. Official inquiry was made by army medical officers, who took the returns of health and mortality for twenty years back from barracks situate in different parts of Great Britain, where troops similar in numbers and performing similar duties had been quartered, and these returns were tabulated, the results obtained proving that the barracks adjoining the Edinburgh sewage meadows had the lowest sick and death rate in the list, so that the allegations against the Craighentilly meadows fell to the ground. It must not, however, be supposed that rough-and-ready sewage irrigation is advocated, as the evidence should only be taken as proving that the application to land of putrid and crude sewage in the most gross form does not necessarily breed a pestilence, though such mal-arrangements may produce an offensive nuisance which ought not to be continued.

**The Pneumatic System.**—One of the most complicated and costly processes for dealing with the solid of human excreta (not with town sewage), is the system known by the name of the inventor, Capt. Liernur. The pneumatic system has been partially introduced at Leyden, Amsterdam, and Dordrecht, where they have seen it working. They agree that the pneumatic system is ingenious, but it is complicated in its construction and working arrangements, and consequently it is liable to derangements which are sometimes difficult to mend. They do not know one English town in which the apparatus, if adopted, would be other than a costly toy. As may be imagined, when the nature of the arrangements and complications are considered, the pneumatic apparatus gets out of order, the slightest crack in any pipe or pipe-joint will reduce the force of the partial vacuum, and even where all the apparatus remains sound the closet-pans may not be emptied; and, in fact, neither the pipes nor the pans ever are entirely emptied; the power of air and water to remove solids through pipes being as their relative weights and velocity, and air is to water, by weight, about as 800 to 1.

**Town Sewage: Its Treatment and Characteristics.**—All chemical treatment of sewage, by patented processes or otherwise, aims at deodorisation; that is, a clarification and purification. The processes are reported to take from sewage turbidity, colour, and scent; but no such process has ever restored sewage water to its original purity, though most of the suspended solids may have been removed, the salts of sewage remain, and generally some of the chemicals, mixed with the water. The only safe way to utilise sewage is by a daily application of it to land whilst it is comparatively fresh, as at Bedford, Aldershot, Carlisle, Doncaster, Chorley in Lancashire, Leamington, Rugby, and other places where sewage irrigation has been established and the sewers transmit in a continuous stream the daily volume. Receiving sewage in tanks to abstract the solids will add to the impurity and offensiveness of the fluid if there is any lengthened retention, or if the

tanks are not rigidly cleansed at short intervals, so as to remove any of the leaven of putridity from the surfaces. All sewage-tanks should be simple in form and construction; the material should be either of a vitreous character on the surfaces, such as glazed bricks, or of Portland concrete; no sewage-tank should be arched or vaulted over. There may be an open-sided shed louvered at the ridge, and the area of land occupied by both yard and tanks should be fenced in. The sludge separated from sewage contains from 80 to 90 per cent. of water, and if deposited on the surface in this state it will not dry in any reasonable length of time, but will skin over and remain wet. Artificial drying is not practicable on account of the cost. Mixing with dry ashes and street sweepings appears to answer best.

**Unventilated Foul Sewers and Sewage Tanks Dangerous.**—Foul sewers and foul vaulted sewage-tanks, if unventilated, will contain carbonic acid gas, and will give off sulphuretted hydrogen, both of these gases being generated from decaying vegetable and animal matters. A complete and perfect disinfection of sewage and sewage deposit by the addition of any known materials, solid or fluid, would be so costly as to be impracticable, and the materials so disinfected would have no equivalent increase in commercial value. To completely disinfect one cubic foot of sewage-sludge and excreta would cost, in the materials, about 1s., or 27s. per ton.

**Details of the Modes of Dealing with Sewage.**—The application of town sewage to land is shown in this report to be the cheapest mode of disposing of it. The first cost of purchasing land for a sewage farm, of preparing this land to receive and filter sewage, and of constructing the necessary works and machinery, may require a rate in aid during the term allowed for repayment of the capital; but in most cases, where the sewage can be applied at a reasonable cost, by gravitation, so far as our investigations have been extended, there will be an available income from the farm at the termination of the temporary debt. Sewage irrigation should in all cases be practised where there is land to be obtained, and the prospect of a balance of income in its favour, as sewage-grown grass is wholesome, and when used for dairy-cow feeding produces good milk, and affords employment to a large number of labourers. The application of sewage to land need not in any case produce a swamp, nor generate malaria, as the volume of sewage applied at any period should be delivered in a thin film, such as the land can absorb at once; that is, within a few hours of its delivery. Sewage should not in any case drench the land to which it is applied, as is usual with water irrigations, where extensive areas are laid under water for several days at a time. The volume of sewage from any town being known, the sewage-farm should be from 10 to 15 per cent. greater than the area required for one week, and no more than one-tenth of the area of a sewage-farm should ever be under sewage at one time.

**Rent of Land used for Sewage Irrigation Extensive.**—At Croydon some 515 acres of land are under irrigation, the population being about 55,000. This is at a rate of nearly 10 acres for each 1,000, or about one acre to 100. The land in use had an average rental of 26s. to 30s. before the Croydon Local Board of Health required it; the rent now paid averages 10l. per acre per annum.\*

#### Sewage Farms.

A sewage-farm should be so laid out and managed that a sufficient area of land shall be under sewage every day in the year, winter and summer; and as town-sewage is seldom below 40 degrees in temperature, irrigation can be carried on. And if sewage should freeze on the surface of land which is without crop no injury is done, and when thaw sets in absorption takes place. The mode of laying out a sewage-farm cannot be fully described in this report, but see the maps and diagrams for partial elucidation. As a rule it may be stated that the works should be simple in character, that they may be cheap in construction. Good examples may be seen at Doncaster, at Bedford, at Leamington, and at Aldershot. Permanent sewage-carriers should contain the land and be laid so as to be level, the grade of the land being provided for by vertical steps, regulated by stops, overflows, and wash-outs; side-junctions to be provided on the lower sides of the carriers to draw off sewage for distribution over the land. If a permanent

\* A sewage-farm will not bear a rent of 10l. per acre. About half this sum is as much as should be paid if the income is to cover the expenditure.

sewage-carrier is laid with a fall, it will be impracticable to block the flow at any point and preserve an even surface, as sewage blocked in a sloping channel would flood over the point of stoppage; hence the necessity for level lines at the surface. Tributary-carriers may be made by a plough, the cross-sectional form and the gradient being suited to the character of the soil; the larger carriers may have a grade of 1 in 400; the smaller, or "herring-bone lines," may have a grade of 1 in 300. These temporary carriers will be broken up with the plough at intervals, and be renewed as required.

**Area of Land required for a Sewage-Farm will depend on Local Conditions.**—The area of land required for a sewage-farm will be governed in a great measure by the character of the subsoil, as if it is very porous or otherwise; as also by the volume of sewage and subsoil-water in proportion to the population. At Doncaster, with a sewage-farm of 264 acres, and a population of 20,000, the average daily flow of sewage being about 600,000 gallons, 120 acres of land of a light sandy and open character have for three years absorbed the entire sewage, only about five acres at any one time being under sewage, and one acre has occasionally absorbed the entire volume of one day. At Croydon about one acre to each 100 of population has been provided. For a population of 60,000 there are about 15,000 water-closets in use; or one to four of the inhabitants. There are the contents of 25 water-closets in 20 tons of sewage each day; or, about 7,000 tons of sewage per acre per annum. Small fields enclosed by large fences will be detrimental to sewage farming; land which is open and without inner fences, having a uniform surface and gentle slope to the south, will be most advantageous. Italian rye-grass is probably in all respects the most advantageous crop to be grown under sewage, as it absorbs the largest volume of sewage, occupies the soil so as to choke down weeds, comes early into the market in spring, continues through the summer and autumn, bearing from five to as many as seven cuttings in the year, and producing from thirty to fifty tons of wholesome grass upon each acre. It is most profitable for feeding milch cows. A dairy and a sewage-farm should, therefore, wherever practicable, be associated. A portion of each farm should be specially deep-drained and prepared for land-filtering the sewage during winter or wet weather.

**Drains and Water-closets.**—Drains must not traverse the basements of houses, but must commence at an outside wall and be fully ventilated. Water-closets must not be within the body of a house, but against an external wall, the soil-pipe being ventilated above the roof, with an open top, so as to ventilate fully, the water-closet room having full and free ventilation at the ceiling. The main sewers must be true in line, having smooth and even gradients, and be fully ventilated. The water supply must be constant and abundant, laid on to each house and to each water-closet; contamination by sewage-gas within dwelling-houses will then be practically impossible. Sewage is the waste water from towns, and the polluted water and liquids from manufactures. Where the privy, cesspit, and cesspool are retained the corrupted fluids from these pass into the sewers. Sewage is injurious in proportion to its age and putridity. Fresh sewage, if removed day by day, does not, in that time, become putrid; and, consequently, is not so injurious to health as putrid sewage is. Where water-closets are in full use, as in London (about 700,000), in Croydon (15,000), in Leamington (about 8,370), in Harrogate (about 1,620), in Cheltenham (about 8,500), and in like proportion in some other towns, the entire of the polluted fluids, with the effete matter of the water-closet, passes at once to the common outlet. The London sewage is at present wasted into the river Thames; but at Croydon, Leamington, Harrogate, and Cheltenham the sewage is purified by irrigation, in each case producing useful crops of grass and vegetables. Where towns are situate on the sea, or on the estuaries of tidal rivers, sewage is wasted,—as at Brighton, at Liverpool, at Sunderland, and even at Edinburgh, where the Water of Leith intercepting sewer discharges the sewage from a population of about 100,000 by a cast-iron outlet direct into the Frith of Forth. When sewage shall be wasted in preference to utilising it, must depend upon local conditions. The waste of sewage must not, however, produce a nuisance injurious to health, and this wasting of it certainly ought to be cheaper than using it under any of the precipitating and



chemical or irrigating processes at present known.

**Clarification of Sewage.**—Clarification by deposition in tanks and treatment by chemicals remove *debris* and suspended matters from sewage, but, as explained, will not fully purify the fluid. This removal of the solids will, however, be an advantage, as a vast mass of matter liable to choke the bed and banks of a stream or river will be removed, which, when allowed to accumulate, becomes putrid and offensive. The gross cost of purifying sewage by irrigation is, per ton, at Doncaster  $\frac{2}{3}$  of a penny, at Bedford  $\frac{1}{2}$  of a penny, at Leamington  $\frac{3}{4}$  of a penny, at Cheltenham  $\frac{1}{2}$  of a penny, and at Banbury  $\frac{3}{4}$  of a penny. These farms may be accepted as fair samples of thus utilising sewage. The use of sewage in agriculture is comparatively new, and the best mode has not in all cases been practised. They, however, indicate Aldershot, Bedford, Doncaster, Leamington, Wolverhampton, and Wrexham as good examples. At Leamington Lord Warwick leases the sewage to be used upon a portion of his estate, and at Aldershot, Wrexham, and at Doncaster the sewage and the land are leased, and are worked independently by gentlemen of intelligence, who make such experiments as they think proper, and vary their modes of culture as best suits the sewage, the land, and the crops to be grown. The attempts to economise in town scavenging and sewerage by removing human excreta separately has been a failure; by the dry-earth system, the Goux system, the Rochdale pail system, or by any other of the patented systems, so far as are known to them; the local costs have been largely increased, and the local nuisances also, in proportion to the time of retention of the excreta before removal; there is also the inconvenience suffered by trespass on the privacy of the household.

**Details as to Irrigation by Town Sewage.**—As they recommend the application of town sewage to land, they at the same time wish to guard against some extravagant expectations of the agricultural benefits it will confer, which are held and advocated by a few zealous and enthusiastic theorists. The continuous application of town sewage to all soils is by no means an unalloyed benefit; as in some cases and seasons, and especially upon clay land, it may be rather injurious than otherwise. Very few crops are actually benefited by the direct application of sewage upon a stiff and retentive soil; indeed, Italian rye-grass, cabbage, and mangold-wurtzel seem to be the only farm crops that persistently flourish upon any soils, heavy, or light, under continual doses of town sewage. No growing crop, save natural grass, should be sewage during the depth of winter; and for potatoes, turnips, most vegetables, and certainly for all pulse and cereals, the land ought rather to be enriched by frequent irrigation in the preceding season, than treated with sewage when these crops are growing; except in times of great drought, and even then care is requisite. A very limited experience soon teaches us that the purification of a constant flow of sewage, and which is frequently greatest when least wanted on the farm, must bring certain difficulties in its train. The cultivation of sewage land, for instance, requires more than double the amount of manual labour which is usually employed upon arable land, and more horses must be kept than upon an ordinary farm. The amount of capital, even where the produce is sold off as soon as grown, must be greatly in excess of that required for the general ordinary cultivation of the soil; while to properly stock and work a sewage-farm upon which the main produce is consumed, quite five times the usual amount of money will be needed. One of the greatest difficulties is to keep the sewage land clean, as not only does every seed and the minutest portion of a root-weed grow, but sewage itself often contains the seeds of numerous weeds which have been washed down from the fodder and straw of stables and cowhouses in towns. There can be no doubt now, after the experience of some years, that the land best adapted for sewage irrigation is a warm friable loam. The only instance in which town sewage irrigation is a decided financial success is that of the Craighentiny Meadows, at Edinburgh. These meadows are, however, in reality for the most part only a deposit of sea sand, washed and blown from the adjoining estuary, and the main produce grown is nothing more nor less than luxuriant couch-grass. The enormous amount of coarse forage which is produced from such a naturally sterile soil shows the fertilising properties of town-sewage, and also points still

more distinctly to the fact that a sewage-farm should consist of land through which the sewage can readily filter. It is strange that although deluges of crude town-sewage have been poured upon portions of these Craighentiny Meadows for 200 years, the discolouration of the sandy soil only extends a few inches below the surface, and that at the depth of a foot the sand appears as bright and clean as that upon the adjoining seashore. There seems no doubt that even the lightest soils should have a few deep under-drains, as at Doncaster, and Heathcote Farm, Warwick, so as to prevent the sewage-water from lodging in the subsoil. All land of medium staple should be thoroughly underdrained, and clays require the drains to be multiplied, so that the interval between them shall not be more than 15 ft.; and care should be taken that the drains are so formed that no sewage-water can flow vertically into them. To prevent this, upon the top of the drain-pipes, a foot of the most retentive portion of the soil should be damped or puddled, and tightly rammed down, so that the sewage-water after percolating through the subsoil shall flow horizontally into the drains, and not rush into the drain-pipes through the loose mould or cracked clay directly from the surface. As most sewage-farms are at present under the control of ever-changing town councils and local boards whose members must as a rule be ignorant of practical agriculture,—and whose theories upon the subject may be wild and visionary,—it is surprising, the Commissioners ask, that such poor returns have hitherto resulted from the application of town-sewage to the growth of crops? Disappointment has been expressed at the poor financial results of sewage-farms. Agriculture is never a specially lucrative business, and during the last few years it is probable that strictly accurate accounts would prove that very little profit has been derived from the ordinary cultivation of arable land. Farms to which town-sewage is applied have invariably many unfavourable circumstances to contend with. The rent, except where the local authority has land of its own, is certain to be extravagant; the application of sewage is often too costly; the management is frequently changeable and faulty, and the prejudice against the produce of the farm is, in some districts, obstinate and widespread. But they, nevertheless, arrive at the satisfactory conclusion that where a fair rent is charged for suitable land, the sewage cheaply and regularly delivered, and a good market is close at hand, there is no reason to doubt that the return for capital judiciously expended upon sewage-farms will produce a higher rate of interest than the money invested by the majority of the tillage farmers throughout the country.

#### AGRICULTURAL PROGRESS AND LEGISLATION.

THE INSTITUTION OF SURVEYORS.\*

THE Agricultural Holdings Act was the most prominent of our discussions during the last session, but those upon the Valuation Bill were scarcely less important. That Bill was withdrawn owing to the pressure of Parliamentary business, in order to be renewed in the coming session, and that discussion was understood to have attracted the attention of some at least of those who are responsible for legislation. Whatever its provisions may be, the new Bill relates to a question of so much importance that it can hardly fail to be one of the subjects to occupy your attention in the coming session; I trust that county boards may be adopted.

The working of the Sanitary Acts, and the disposition of sewage, is another matter which requires much consideration. The protection of the domestic life and health of the people has been recognised only recently as a fit matter for legislation, notwithstanding that few subjects can compare with it in importance. It ramifies in so many directions—the pollution of rivers, and consequent defilement of the waters of the towns; the utilisation of town sewage; the frequent contamination of wells by the proximity of cesspools and house drains—that the provisions of these Acts are constantly recurring in practice.

The Commons Inclosure Act of last Session was probably the best that could be passed: certainly was better than none at all. Public opinion, which thirty years ago applauded the man who made two blades of grass to grow

where one grew before, is now exercised in keeping common lands unimproved. Except in the neighbourhood of towns, I know no common which is not a nuisance to the vicinity. It is the abode of a vagrant, lawless population, whose miserable hovels are the disgrace of the neighbourhood, and whose presence is its terror. The suburban common and village green undoubtedly require to be preserved for the sake of recreation and enjoyment, the proprietors being properly compensated for their rights; but the commons which lie at the backs of cultivated parishes, far away from the villages, and frequently at considerable elevations, require no protection. A few miserable sheep maintain an unhealthy existence upon the poor and starved herbage, while the well-grown sheep of the adjacent cultivated farms are jealously kept away for fear of infections. The whole productive power of the land is probably less than one-third of its power if in severity. Such a common has been supposed to belong to the lord of the manor and the commoners, and to be as much private property as an enclosed field, subject like the field to roads and pathways for the public. The recent Act contains a section enabling other persons, besides the lord and the commoners, to take steps to prevent any inclosure of portions of the common, by action in the County Court, subject to an appeal to the Courts above, and this provision introduces an entirely new element in the inclosure of commons.

The Artisans' Dwellings Act was fully discussed in this room. Parliament wisely left the initiative to the persons locally interested, but in its desire to provide a prompt remedy for neglect, it has given its sanction to somewhat summary processes for the purchase of property. There may be reason in withholding the usual allowance for compulsion where property has been suffered to become a public nuisance, but it is not so easy to see why an owner of adjacent good and habitable houses, required for the full development of the improvement scheme, should be subjected to the same provision. If the words "within such area" in the 3rd clause of the Act mean only the area covered by unhealthy houses, the provision may be reasonable; but if they mean the whole block, including neighbouring properties not condemned as unsanitary, but needed to be taken to give completeness to the scheme of improvement, then the owners of good houses are punished for their proximity to bad ones. It is stated that a case involving the question of giving the allowance for compulsion upon healthy houses of large value has actually arisen, and the owner of this valuable adjacent property is waiting for the decision. The right of petitioning Parliament against any scheme is reserved, but subject to the liability, on the part of the appellant, of being saddled with the whole of the costs should a majority of the committee present be of opinion that the petition is (not vexatious, but) not justified by the circumstances. This is a risk which few petitioners would care to incur, and renders the right of petitioning of little value. This power of awarding costs was conferred on a Committee of Parliament so recently as 1866, by the 28 Vict., cap. 27, and was "exercisable only where the Committee shall unanimously report that the promoters of a Bill have been vexatiously subjected to expenses." The difference between a majority of a Committee deciding that an opposition is not justified by the circumstances, and a Committee deciding unanimously that an opposition is vexatious, is very great.

One of the most remarkable events from our point of view that has occurred during the year has been the publication of what is known as the Domesday Book of 1873. Collated as it is from written records in the care of the Assessors of poor-rates, it contains many inaccuracies and many items,—such as gas-works, railways, and iron works,—which are misleading, culminating in the river Wear Commissioners with three acres of land and a rental of 20,609l. per annum. Its appearance adds to our admiration of the fulness and completeness of the Domesday Book of William the Conqueror. Eight hundred years have elapsed since the king's scribes passed through the length and breadth of that same England (which has never since been diminished), and recorded not only the proprietorship of the land, but, as was said at the time, every horse and pig that was maintained upon it. Information of this latter nature is now given yearly in the Agricultural Returns, which afford such full and valuable details of the acreage under each kind of corn and green crops, and of pasture land, and of every kind of stock which is maintained by our alternate system of husbandry. No inter-

\* From the opening address by Mr. Edmund James Smith, president, at the ordinary general meeting, November 13th.



mediate record exists relating to the whole country. As regards the properties of most of the bishoprics and chapters, a complete account was obtained about 1650, and the renewal of leases septennially for the succeeding 200 years would afford much information as to the rise and fall of rents in that period. It is probable that the Oxford and Cambridge colleges would be able to supply the same information as regards their property, and some principal landowners must have continuous rentals of their estate; but in future no doubt the record will be revised not less frequently than each quarter of a century.

The recorded owners in the original Domesday are stated as 5,000 out of a population probably of 3,000,000, and the new Domesday gives about 1,000,000 of owners, three-fourths of whom are the possessors of not more than an acre, leaving possessed of more than one acre about one quarter of a million out of a population of 20,000,000, of whom one-half inhabit towns and invest very little in land. In Northumberland the ownerships over an acre average 500 acres each; in Wilts they average 200 acres. In the rest of England they average from 100 to 150 acres. In the counties of Cambridge, Chester, Derby, Gloucester, Lancaster, the ownerships average more. In Somerset, Stafford, Surrey, Worcester, and West Riding of York, they average about 10 acres, and in Middlesex 50 acres. It is curious on reading over the names of the untitled nobility in the several counties of England, to note how many have occurred in the chronicles of Crecy, Poitiers, Agincourt, and the French wars, and how many more distinguished themselves in the histories of the internal affairs of the country before the reign of George III. Some names, such as Musgrave of Edenhall, take us back to the fairy lore or the unwritten traditions of a high antiquity. Some rest upon success in trade or professional distinction in law or in arms; some upon the distribution of property of the Tudor Sovereigns; and some upon the accidental possession of estates brought by the extension of our towns into fabulous value. Whether the law of entail which secures the estate for the most part against the extravagance and the folly of the direct heir by providing that it must pass in its integrity to the next descendant of the founder, is based upon a better principle than that which divides each estate amongst all the children of the founder, is a question which we need not stop to discuss, but it certainly has the effect of maintaining a long connexion between the family and the tenantry, and secures the latter from the danger of the sale of the estate and its consequent transfer to strangers.

It would repay any one interested in the particular farms described in 1851 by Mr. Caird, to compare their condition at that time with their state under their present occupations. He would find a more spirited husbandry, effective drainage, better buildings, much better cottages, much better wages, and general improvement; but he will rarely find any material increase of rent, irrespective of interest on the cost of improvement. There will be a larger capital employed, and a much larger yearly produce, but the rent will generally have increased barely to the extent corresponding to the capital expended in improvement. The fee-simple value will have materially increased, and, in consequence of the enormous accumulation of capital in the interval, I have an ordinary farm, lying between two competing proprietors, sold at fifty-four years' purchase on the utmost rent obtainable.

Some portion of the increased produce from farming is appropriated to interest on capital expended in drainage, in cottages, or in buildings; some to interest on tenants' increased capital; more is absorbed by increased wages; a portion pays the increased rates and taxes.

The better buildings speak for themselves to the eye; the thorough drainage will hardly be disputed, but a comparison can be made as regards wages more easily than with regard to any other portion of the increased expenditure as compared with 1851. According to a table in page 512 of Mr. Caird's book, the average wages in twelve northern counties in 1851 were 11s. 6d. a week, and in twenty southern counties were 8s. 5d. a week; and it is added that in the preceding eighty years there had been no increase of wages in several southern counties, for instance, in Suffolk and Wilts; and an increase of less than 14 per cent. in the eighteen southern counties mentioned by Arthur Young in 1770.

It was time that wages should increase; and their increase in the twenty-five years since 1851 cannot be taken to average less than 50 per cent. on the rates above mentioned. In Durham and the manufacturing counties the increase is more than 50 per cent. The reaction which has recently set in will prevent the present rates from increasing for many years.

Nor does the increase of 50 per cent. in the rate of wages measure the improvement in the condition of the labourer. All those articles of consumption which may be called home comforts,—tea, sugar, tobacco, &c.,—are reduced in cost some 40 per cent., while clothes and other necessities are both better and cheaper. The cottage is frequently a little more costly than in 1850, but more comfortable, and in a sanitary point of view generally unexceptionable. The maintenance of close parishes has been rendered useless by the extension of the area of rating, and in consequence the cottage is placed as near as may conveniently be to the labourer's work, and the fatigue of the daily walk to and from his place of labour reduced to its minimum.

One cause of the disproportion, in 1850, between the wages of 11s. 6d. in the north, and 8s. 5d. in the south, was the manufacturing demand for labour in the north; but this was intensified by the operation of the law of settlement which chained the labourer to the parish where he was born. This law was practically abolished in 1865, and only from that date has the labourer been free to take his labour—the only commodity he has to sell,—to any part of the kingdom. This freedom was largely exercised during the demand, in 1873, for more men in the coal and iron districts in the north, many hundreds leaving the eastern and south-eastern counties, and obtaining in the north 21s. a week or more for their labour, instead of 11s. or 12s. in the south. But if the wages were higher the work was harder, and the habits of life quite different from those to which the strangers were accustomed.

A colliery life, even if the man be employed on the surface, is rather a town than a country life. The pit is sunk, and a pit village of probably 300 houses is built very near to the pit. The houses are arranged in streets, and the population causing a demand for consumable articles, the corners of the streets and perhaps a row of houses in the main road are made into shops. Every man lives under the observation of his neighbours.

Until a few years since, the cost of building a colliery's house was barely 50l., and it was one story high; the least costly now involve an expenditure of 100l., and many of 120l., and none are less than two stories. The new collieries have for some time a large proportion of persons of roving and unsettled habits, the refuse of the older collieries and inexperienced strangers; but the colliers in the older collieries are a remarkably orderly set of men; generally Dissenters, for until within a few years the Church of England did not provide any means of worship save at the Parochial Churches, and the Parochial Church was generally miles distant from the colliery. Now, church and school are generally to be found at a new colliery, as well as dissenting places of worship.

In 1851 wheat was 40s. a quarter, beef 5½d. per lb., and mutton 5d. per lb. We may now take wheat at 47s. a quarter, beef at 10d. per lb., and mutton at 8d. per lb., and such of us as have lived through the panic of 1851, and still more through the distress of 1836, when the year's average price of wheat was 39s. a quarter, with barley under 30s., and oats 22s. a quarter, can but feel that this year's distress, though severe in many districts, does not present the same features or press upon the country to the same extent as in that period in 1851, which has been so faithfully and graphically described by Mr. Caird, in his "English Agriculture." In 1853, the best harvest occurred that has ever been known, and agricultural distress became a thing of the past.

One half of our population is at present fed with wheat imported from distant countries, and that half of our consumption is brought from the Western States of America, or other distant places, at such prices that the other half of our consumption cannot, it is said, be grown so as to be remunerative to the English grower; and suggestions are made for the adoption of a different system of cultivation.

There is a wide difference between panic fear and a grave consideration of existing facts, and the impossibility of growing wheat at a price of 47s. a quarter is not to be admitted without

clear proof. In the last forty years wheat has ten times averaged less than 47s. a quarter for the year; in 1835 it was 39s., as before mentioned; in 1851 it was 39s.; in 1861 it was 40s.; and in 1870 it was 47s.; and on each occasion it soon rose materially. Whatever the causes, the facts are certain, and it may fairly be inferred that what has so often happened is not unlikely to happen again; although it may be difficult to predicate the precise form and the cause of the change. The reaction from the excited prices of almost all articles of commerce, but especially of iron and coal, in 1874, necessarily affects the price of all articles of consumption, and it is much more difficult to say why the loan of money should be cheap, than why wheat should be cheap.

How a good state of moral and intellectual character in the labourer, supported by a full rate of wages, is to be managed so as to enable this country to compete with the labour of other countries where the labourer is not cultivated to so high a standard, nor used to the same comforts, is one part of the present difficulty; and this may be met, in some degree, by the substitution of intelligent supervision of machinery for the exercise of manual labour wherever such substitution is possible.

In 1851 the thrashing-machine had hardly established itself, the imperfect arrangements for ploughing by steam were just commencing, and after that came the reaping-machine, all successively requiring more mind than mere manual operations. At the present time all these pervade the land, and are gradually assisting to exercise the intelligence of the agricultural labourer. And when this higher standard of intelligence is attained generally, it may well be that the increase of wages will be greatly compensated by more intelligent work. Possibly one of the points to which we have not sufficiently attended is, that the implements necessary to enable us again to produce at such prices as to be able to meet foreign importation have not been adopted more thoroughly.

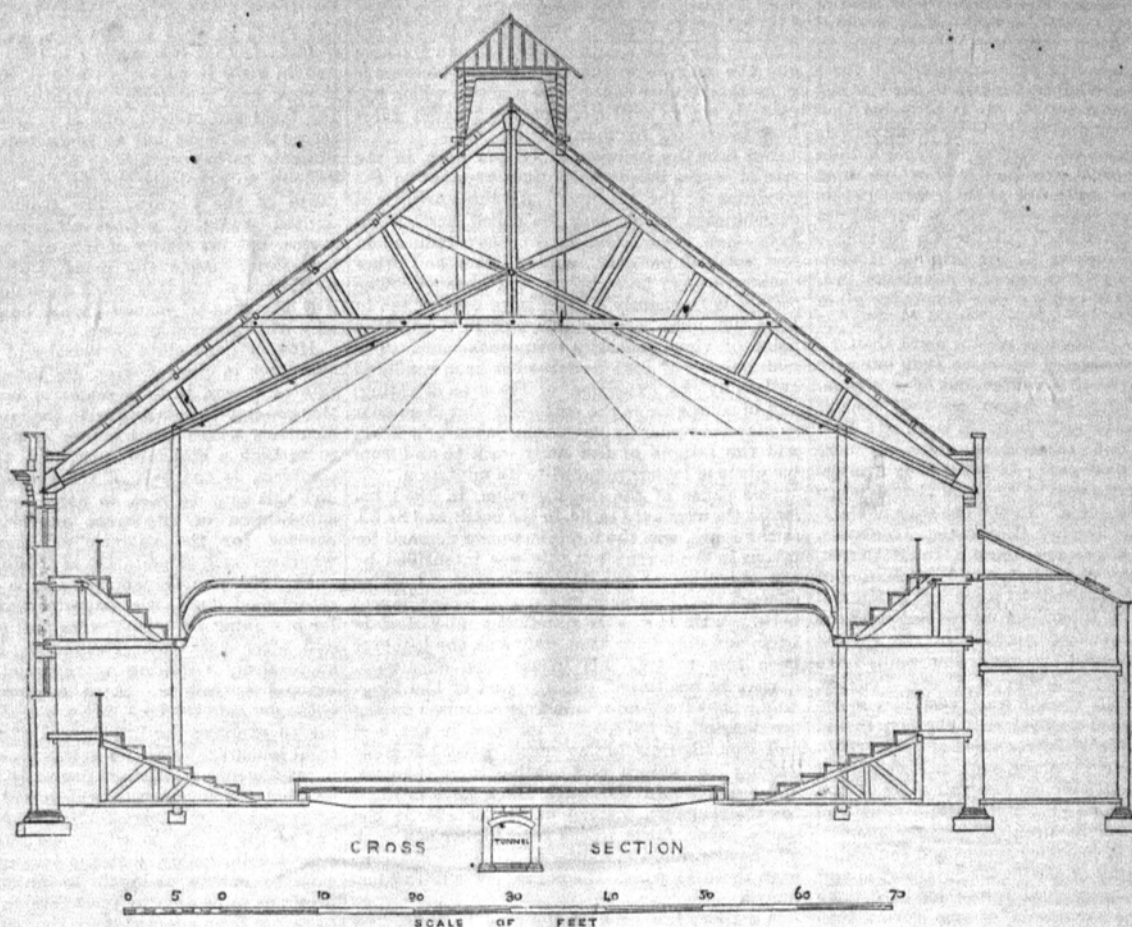
As I have before pointed out in this hall, the rent of the Whitfield Example Farm was 44 per cent. of the value of the gross produce before the outlay upon it in 1840, and was 20 per cent. of the value of the subsequent gross produce, and yet was 375l. as against 200l. previously; the value of the produce having been 1,912l. in the one case and 463l. in the other. The further increase of produce will probably afford room for the satisfaction of all the various claims upon it, and every mechanical and manual economy in cultivation will increase the margin required to recompense the additional outlay.

And again, every quarter of wheat brought from foreign countries, as it increases the demand for labour at its place of produce, tends to raise the labourers' wages there, so that the foreign grower has to undergo difficulties similar to those borne by the English grower. When prices become unremunerative the reflux of labour materially affects the rate of wages in this country, and it is stated that, in the last year, the immigration to England from America was only one-third less than the emigration from England to America.

The present depression may be expected to pass away as previous depressions have passed away, searching out, however, in its progress the estates which remain unimproved, undrained, without good cottages, without efficient buildings, and without confidence of tenure. But the estates of this class will, in 1876, bear a very small proportion to their extent in 1851.

The systems of tenant-right in Surrey, Sussex, and the West Riding are the subjects of deserved reprobation, as unjust to incoming tenants, ruinous to the land, and injurious to the landlord, as producing a system of fraud and chicanery which all intelligent farmers were desirous of seeing terminated; while, in Lincoln and Nottingham, the system of husbandry, with compensation to out-going tenants, is described as no whit superior to that of West Norfolk, where capital was not protected by any system of tenant-right. The land round Stamford, lamented over by Arthur Young in 1770 as uninclosed, with the words, "It is melancholy to think that, in an age wherein the benefits of inclosing are so well understood, such tracts should remain in such a comparatively unprofitable state"; and which in 1851 remained as they were in 1770, have since that period been inclosed, and are recovering from centuries of neglect. There are still, however, some common fields not far from Stamford, which are in as discreditable a state as they





HENGLER'S NEW CIRQUE, LIVERPOOL.—Section.

were a hundred years ago. The extent of improvable land in Cannock Chase, some 14,000 acres, is remarked upon; the whole lying uncultivated. But, since 1851, this barren land has been found to contain coal, and the heretofore worthless property has realised not unfrequently 700*l.* an acre. Cottages, coal pits, railways, have been made upon it, and the greater part is covered with a busy, industrious population.

#### HENGLER'S NEW CIRQUE, WEST DERBY ROAD, LIVERPOOL.

THE annexed engraving represents one of the largest permanent circuses in the kingdom, and which was opened a few days ago. It stands at the junction of Walker-street and West Derby-road, Liverpool. The front elevation faces the West Derby-road, and is carried out with red pressed bricks, relieved by ornamental dressings. In the front of the main building there are five shops, with principal entrance to the Cirque in the centre leading to stalls and boxes, below the level of the wall at the end of it, shown on the plan. This entrance has iron ornamental gates. The floor is laid with tessellated pavement, and glazed doors are placed at the end to prevent draughts. A commodious vestibule is provided here with cloak-rooms for the audience of stalls and reserved seats. On the right-hand side is the entrance to pit, balcony, and promenade. The entrance to the gallery is in Walker-street, and is reached by a stone staircase, with level landings. An extra exit door from the pit is provided in this street; also an extra exit for parterre and gallery.

At the rear of the building is stabling for fifty horses, with carriage-shed, and the usual stable requirements. Six dressing-rooms and commodious wardrobes are at the side and back of the main building.

The interior of the building is fitted up after the arrangement of Mr. Charles Hengler's other permanent circuses in Glasgow and London, which have been carried out by the same architect, Mr. J. T. Robinson. The seats are all arranged so as to give a view of the arena, and are divided into five private boxes, 200 reserved stalls, 600

seats in the parterre, 2,000 in the pit and balconies, and 1,600 in the galleries, thus having accommodation for 4,500 people.

The construction of the roof is novel in design, the span being 100 ft., and the collar-beam is 18 ft. from the feet of the double principal rafters; 1½ in. tension rods are placed from the feet between these rafters, running to the bottom of the king-post, and thence to the top of same, thus forming a light timbered roof and an iron one at the same time; 9 in. by 3 in. purlins are placed every 3 ft., resting on the principals, and are covered over with dry 1½ in. boards, and then slated. A syphon ventilator is formed in the centre of the roof, 12 ft. square, and inlets of cold air are fixed in convenient places to assist this ventilation and avoid draughts. Special care has been given to this part of the arrangement, with what result we have yet to learn.

The ceiling is constructed of wood and canvas, formed into panels and ribs, with bosses at each intersection of the ribs, from which drop chandeliers of brass, containing fifty lights; there are twelve of these in number. The sunlight has a domed silver plated reflector over it, the idea of the proprietor. It was executed by Messrs. Z. D. Berry & Son, Regent-street, Westminster.

The front and side balconies have ornamental fronts; the caps of pillars have the Prince of Wales's feathers. In the spandrels of the arches are large trophies and flags of all nations. The decorations are carried out in gold on a mauve and pink ground. The ring is fitted with an extra fence, to prevent the soil being kicked over into the face of the audience.

The contract for the main building, stables, and entrances was let to Mr. S. Campbell, contractor, Liverpool. The slating was done by Messrs. Wild & Sons, of Hull. The gas-fittings are the work of Mr. Price, of Liverpool. The fittings for the sunlight, and lights to the exterior, are by Messrs. Z. D. Berry & Son. The iron stable-fittings have been supplied by Messrs. Alderman Bennett & Sons, of Liverpool. The iron gates and seat standards from Messrs. Smith & Co., Sun Foundry, Glasgow. The decorations were entrusted to Mr. Thomas Rogers, of London. The raised ornament to the balcony

fronts, &c., was carried out by Messrs. Jackson & Co., Rathbone-place, London.

Mr. Gilbert, of London, acted as clerk of works and foreman of interior fittings.

#### COMPETITIONS.

*Whitworth, near Rochdale.*—The plans of Messrs. Maxwell & Tuke for the chapels, &c., in the New Cemetery have been chosen by means of a limited competition. The design places the three chapels parallel, like the arms of the letter W, with vestries and covered hearse entrances between a central tower and spire over the north end of the central or Episcopal chapel. The vestry for this is at the back of the building. The buildings will be of stone, roofed with slate, and overhanging eaves with oak barge-boards. The chapels will be warmed with superheated pipes, conducted from the fireplaces in each vestry.

*St. Andrew's, Upper Norwood.*—Messrs. Power & Wheeler, the successful competitors, write to complain of a letter addressed by another competitor to the chairman of the Building Committee, after the decision, impugning the correctness of their estimate. We think it unnecessary, however, to print their statement.

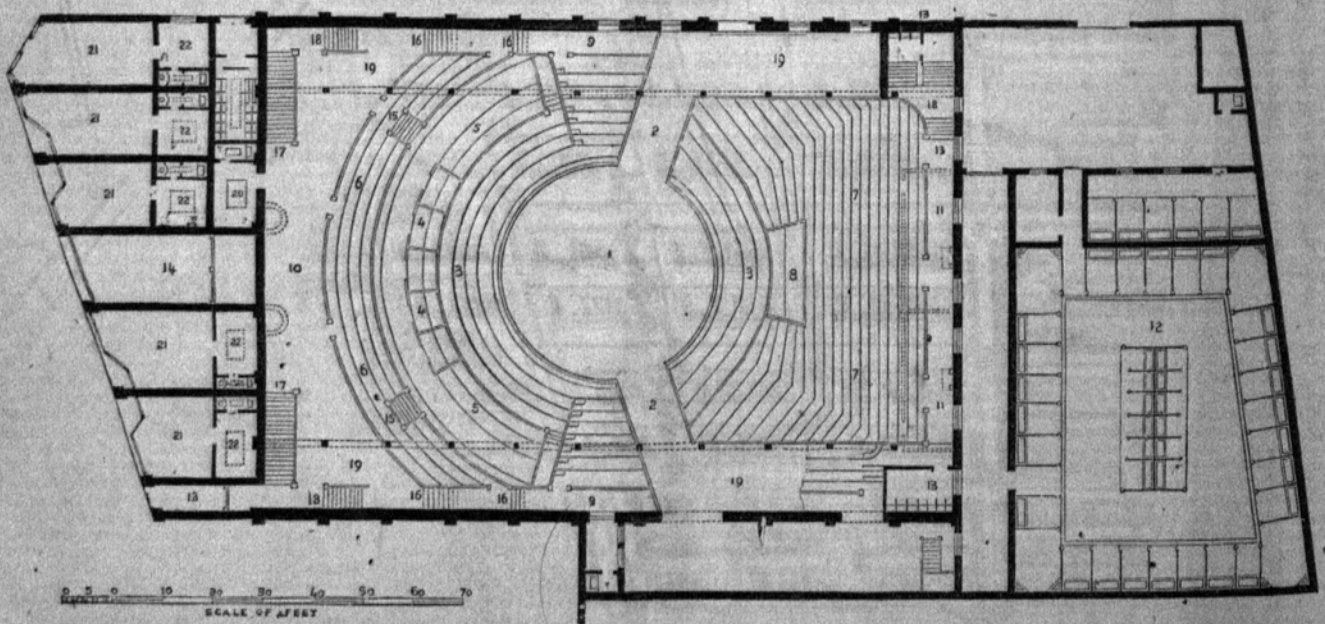
#### COMPENSATION CASE.

JENKINS v. THE SCHOOL BOARD FOR LONDON.

THIS case (heard in the Sheriff's Court, Red Lion-square) was a claim for land required for a new school at Kensal-green, and it was stated that property was rising in value in the neighbourhood. Several witnesses were examined. The value, as alleged on one side, was 2,500*l.*, with the 10 per cent. allowed for compulsory sale, being at the rate of 3,500*l.* per acre, and on the other side the estimate was 1,076*l.*, or 1,500*l.* per acre.

Counsel addressed the Court, and after the learned Under-Sheriff had placed the case before the jury they consulted. A verdict was given for 1,800*l.* The jury had in the early part of the day inspected the land.

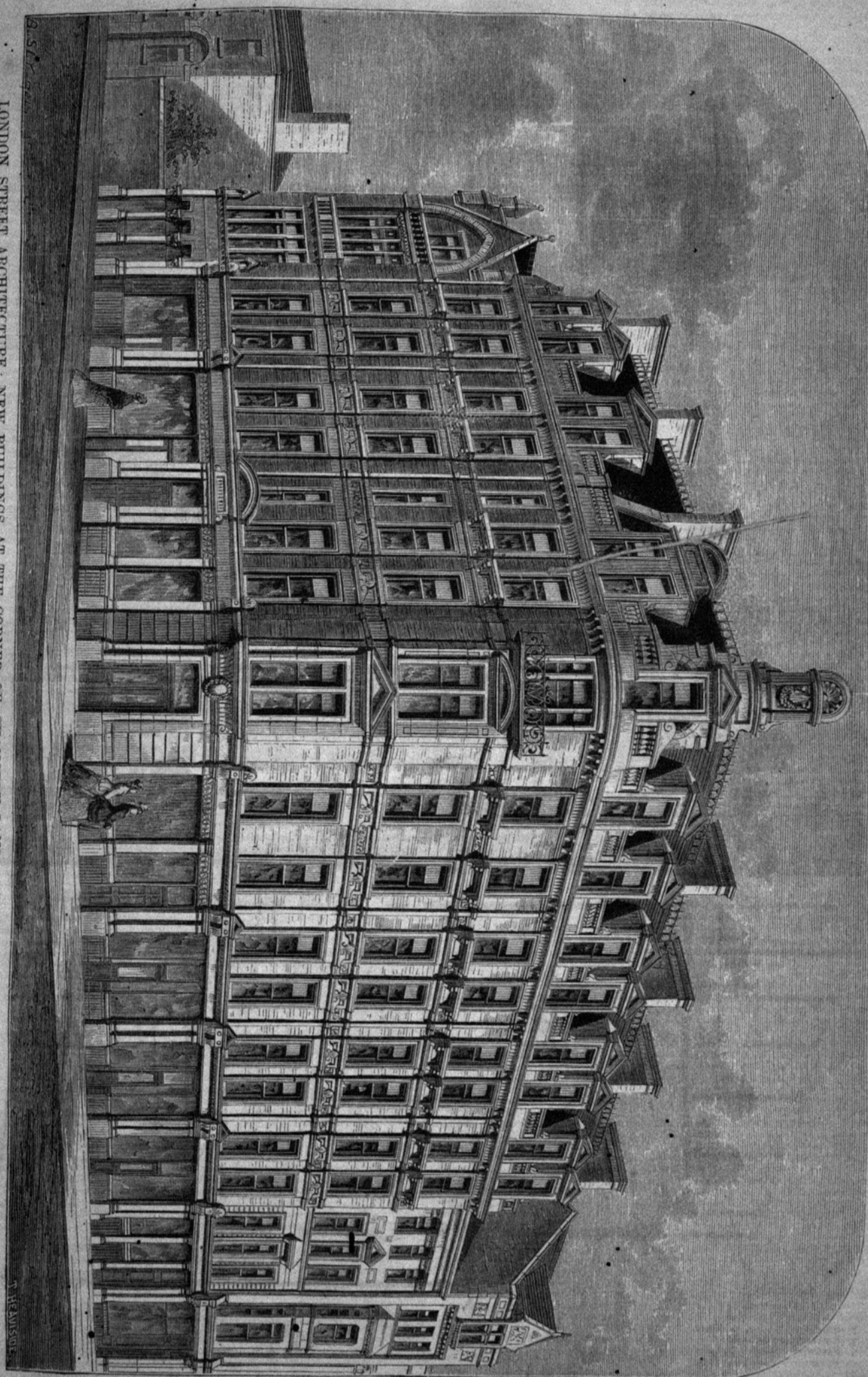




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|----------------------|---------------|---|-------------------------------|---|-------------------|
| 1. Ring.             | 5. Stalls.    | 9. Promenade.                                 | 13. Entrance under.           | 15. From principal entrance to boxes, &c. | 19. Gallery over. |
| 2. Entrance to ring. | 6. Pit.       | 10. Promenade: gallery over; pay-boxes under. | 16. Steps down.               | 20. Ladies' cloak-room.                   |                   |
| 3. Parterre.         | 7. Gallery.   | 11. Promenade: property-rooms under.          | 17. Steps up.                 | 21. Shops.                                |                   |
| 4. Boxes.            | 8. Orchestra. | 12. Stables.                                  | 14. Principal entrance under. | 22. Sitting-rooms.                        |                   |

HENGLER'S NEW CIRQUE, WEST DERBY ROAD, LIVERPOOL.—MR. J. T. ROBINSON, ARCHITECT.





LONDON STREET ARCHITECTURE: NEW BUILDINGS AT THE CORNER OF CHANCERY LANE AND HOLBORN.—MR. LEWIS H. ISAACS, ARCHITECT.

T. HEANSIDE.



## NEW BUILDINGS AT THE CORNER OF CHANCERY-LANE AND HOLBORN.

At Michaelmas Day, 1875, the leases fell in of the plot of land containing five houses in Holborn, two in Chancery-lane, and the restaurant at the corner of the two thoroughfares; and the governors of St. Bartholomew's Hospital, deeming this the right opportunity for effecting the long-needed improvement of Chancery-lane, gave notice to the respective tenants that, on the expiration of their terms, the premises would be pulled down, and the land let on building leases.

Negotiations were at the same time opened with the Metropolitan Board of Works, who readily availed themselves of the favourable circumstances thus presented, and the purchase of the Hospital's interest in the land required for widening the roadway of Chancery-lane was soon effected.

A further strip of land belonging to the Honourable Society of Lincoln's-inn is still needed to complete the improvement, but some delay has arisen in regard to the acquisition of this, owing to the fact that the Government hold a lease of the plot with a right of pre-emption, and as yet no terms have been arrived at for the purchase of this right. Meantime carriage traffic has received the full benefit of the improvement, for the roadway is now sufficiently wide to admit of two vehicles passing abreast. Pedestrians, however, must cross from the west to the east side of Chancery-lane on approaching Holborn, or run the risk of being squeezed or mud-bespattered by the wheels of passing vehicles—a state of things barely safe and certainly highly inconvenient. The Government's interest in the narrow strip of land must be so small as scarcely to be worth consideration, and it is earnestly to be hoped in the interest of the public that the department charged with settling the terms upon which the land can be added to the highway will speedily dispose of this preliminary.

The advantages resulting from the instalment of this street improvement already made are so great and so obvious that it appears almost incredible its accomplishment should have been delayed until the present time.

In arranging the plan of the building plots, Mr. T'Anson, the Hospital Surveyor, appropriated the old corner site to the roadway, thereby reducing the number of the new houses from eight to seven; and, by a further re-arrangement of the areas, three frontages were obtained in Chancery-lane, three in Holborn, and the corner block looking on to both streets. The area belonging to the Hospital Authorities absorbed in the public way is, in round figures, between 1,000 ft. and 1,100 ft. For this area the sum of 5,000*l.* was paid by the Metropolitan Board of Works, or, taking the land uncovered as being worth twenty years' purchase, at the rate of nearly 5*s.* per square foot per annum. In determining the reasonableness or otherwise of this purchase, it should be remembered that the most valuable part of the whole site, viz., the old corner plot, was entirely given up, as also, that the strip in Chancery-lane was all frontage. The purchase of the Lincoln's-inn land not being completed as yet, we are unable to give the total cost of the improvement. Whilst on this part of the subject, we would remind our readers that the terms upon which the new building plots were let to the respective lessees were quoted in a recent number of this journal.

Five of these lessees, taking six out of the seven plots, agreed to avail themselves of the services of one architect, and our illustration shows the result of this arrangement. It is not often that adjoining owners exhibit so neighbourly a feeling; and the public thoroughfares of the metropolis evidence, by the want of harmony in the buildings which skirt them, how sadly architectural effect is frittered away by the little bits into which London is thus cut. In the present instance, as we have said, the owners of six adjoining properties, with practically unlimited powers to determine how their domiciles should be fashioned externally, agreed upon one design, and employed one architect, and one firm of builders to carry the same into execution, rather than exhibit their respective idiosyncrasies in bricks and mortar.

Touching the design, we would remark that novelty is displayed in the treatment of the dressings round the third-floor windows, and the incorporation, so to speak, of the salient features of the principal cornice therewith. The corner next Chancery-lane has received consideration,

as have also the dormer windows and sky-line generally. The materials employed in the front elevations are white Suffolk bricks and Portland stone, the pilasters of the shop-fronts being of polished Aberdeen granite.

The works have been carried out under the personal superintendence of Mr. Lewis H. Isaacs, architect, by Messrs. Scrivener & White, whose representative was Mr. Turner. The contract price for the block of six houses was 20,044*l.* We must not omit to mention that since the completion of the street widening, the District Board of Works have paved the carriageway of Chancery-lane with wood—a boon which, no doubt, is duly appreciated by the occupiers of chambers in Lincoln's Inn and other professional men living in the locality, let the future of wood-paving be what it may.

## HOUSE BUILDING IN OLD LONDON.

On looking carefully down a long list of dates appertaining to any particular country or town, it is singular to note what comparatively small and unimportant occurrences go to make them up, and how many really momentous matters in its history are omitted. The curious reader will find numerous examples of this in a categorical history of London, from its first foundation to the present time. How many items, for example, in the architectural story of London city have been altogether forgotten, no notice apparently having ever been taken of them; and how many things of house-building interest have there been of which no record whatever has been kept. It will be a curious thing to note when the very last record of old London shall disappear, to make room for a more improved state of things. There may, perhaps, be no help for all this, however much it is to be regretted; but two things at least can be done. The past, as Mr. President Barry noted the other evening, is certainly beyond control, but the future, and what to do next, may be dealt with. We may, therefore, yet preserve intact as much as is possible remaining of the London of past days, and we may gather together and carefully keep, and publicly exhibit sometimes, all and every pictorial representation of old London that can be got at, and there is a very great deal of such scattered about, here and there and everywhere. It may be useful to call attention to a little of this, and note its importance and interest.

There are many, doubtless, who may fancy that it is an easy matter to picture the London of the past to themselves, but the fact really is that but little notion can, in the present day, and in the midst of present surroundings, be formed of a state of things so totally unlike it. Looking down a new London street in an "improved" quarter is simply to look for a something to take the eye, and, if possible, to interest the mind of the observer; but, as all must know, the effort is altogether hopeless in nine cases out of ten. There is nothing to be seen but two parallel lines of uniform building; the house nearest you is simply repeated to the end of the perspective and back again, all and everything are alike. More than this, you are quite conscious that the interior of the houses are all of them precisely similar. But in an old London street all these conditions were reversed. Every house was different, not only in external look, but in internal arrangement and planning; and looking down such street the eye could not do otherwise than rest and pause at each house, even while at the same time it took in the whole perspective. No two things, or methods of work, can be more unlike, and there may be some interest, now that architectural practice is going through, as was heard at the Institute, a new ordeal, in looking into and balancing the merits and demerits of the two modes of work, the antique and the modern. And one other item too, and a most necessary one, we would include in it is to cast a glance practically, before it is too late, at one or two things yet remaining of old London house-building. The London house of the past was not only a quaint and picturesque structure, but, as we take it, a "comfortable" house.

We are somewhat at a loss, it must be confessed, for a due and sufficient quantity of evidence, in the way of paper records, of the past system of "building" generally. At times we almost doubt whether a plan or a drawing at all was made of a timber-built house. It would seem rather to have been built up out of the head of the master builder as it went on, in pretty much the same way as scaffolding and

temporary shed building is now. There is hardly any other way of accounting for the strange oddities found in some of these quaint buildings. We are to seek, first, for the whereabouts of the fast-disappearing remains of old London, and then to find out any special value there may be in those remains in detail, and to then contrast it with our modern and more improved system of doing things. We do not propose to exhaust the list of house-building memorials, but only to indicate a few of them. The extension of a town, by the way, of course commences by the adding to the outskirts of it, as seen in the map we have before alluded to; but the "improvement" of a town begins in the thickest and most crowded part of it, so that ancient London began to finally disappear at the centre. The houses, as shown in Norden's map, evidently extended for some distance down and up the River "Thames," on both shores of it, and there is a right tumble-down fragment to be met with, washed by the tide, between Shadwell and the West-India Docks basin. These timber-built houses face the river, and are to be got at through a narrow street parallel with it. They are, of course, inhabited by a somewhat rough race, with decided waterside proclivities, and this fragment of London antiquity, without doubt, affords a glimpse, though, may be, but a glimpse, of the character of London town in the fifteenth and sixteenth centuries, and, indeed, down to the date of our modern improving era. Only few, probably, find their way into this begrimed locality; but many must pass it on the river, and, if so, they must have noticed,—and it is worth note,—not far from it, the sole present representative (in London, certainly) of Gothic boat-building, harmonising completely with the buildings on shore. We refer to the Dutch fishing-boats, five or six in number, admirably built, and, it may be added, designed, with delicate mouldings and curves here and there, and which are well worth careful note. We have improved since the days of Elizabeth in ship-construction, that is certain; but most certainly not in artistic refinement of details. The curious-looking craft drawn by Van den Keere, on his sketch of "Thames Fluvius," might well have had one of these Dutch fishing-boats among them. And while here,—should our reader ever get so far,—it is instructive to get a little farther until he come to a quite new locality, Cubitt-town, and there see numberless lengths of long straight streets, all of them alike, and the houses alike,—a complete contrast to any notion that is to be formed of the old ways of house-building and street laying-out.

But we need not travel into quite so outlandish a region to get a glance at the aspect of London in past days. It may be got at close at hand, and with surroundings on all sides full of interest and suggestive of much. Holywell-street,—Holywell, at the back of the Strand,—and Wych-street, close to it, illustrated in our pages long ago, both contain, strange to say, memorials of the London of past days. They are doomed to destruction, and that in no long time, it is quite certain; so that if any instruction does happen to lie in them, no time is to be lost. Looking up Holywell-street, or, as now named, "Booksellers'-row," a long narrow street is before you, with improvements, many already commenced, and yet going on; but in the midst of it are some of those plaster-covered houses, with gables and quaint overhanging upper stories. This special street is narrow, and will admit but of one "London gondola,"—Hansom cab,—up or down it at a time, so somewhat inconvenient, but in this very narrowness its special character and picturesqueness lie. It gives at least an imperfect idea of past street-building. Some quite new and improved house-building may be viewed on its north side, contrasting with its more ancient portions. What makes it the more telling is the fact of its shops being for the most part open bookstalls, so that here, in spite of drawbacks, a good idea of an old-world way may be found.

One special house, with front in Holywell-street and another front in the Strand itself, is in woeful plight, and covered all over with posters and advertising sheets, so that it is difficult to find the whereabouts of the street-door even, much less the window openings. Its "title deeds" are uncertain, and no man can therefore claim it,—typical of things passing away.

We may well enter, if only for a moment, one of these houses yet remaining of the past, and doubtless so soon to pass away and make room for what is now thought to be so much better a human dwelling. We take a rough one, almost



at a venture, and in an out-of-the-way locality. It is sadly out of the upright, it must be owned, and equally out of order, and in need of the three or four coats of common oil-colour. It is of plaster, by the way, both outside and inside. For quaintness of plan and internal arrangement it might satisfy even Charles Dickens himself, were he but in the flesh, and in need of a place of abode for one of his special favourites. We need not see the basement, for it was evidently constructed as cellarage and storehouse; but the ground-floor arrangement exhibits the great distinction between the house-building of the past and the present. The "passage" is low and narrow, widening a little as you come to the oddly-constructed, but really convenient, staircase, with its many landings and quaint balustrading. The front room is small, but the back room is a magnificent apartment, intended as a kitchen, with huge fireplace, and with convenient shelves round about. It was evidently built as both kitchen and living-room, or "parlour," and so takes one to the simple manners of our unfashionable forefathers. Nothing can be more convenient, and nothing more homely; but the idea, even if changed into more modern shape, is a good arrangement, and suggestive. There are some other small rooms here with purposes not so evident. The rooms above, on the first-floor, have those always quaint and right useful features, projecting windows, so that you can see up and down the street perspective. Here, certainly, is a hint worth the taking. Some of these houses are well worth measuring and plotting by the student, for they are full of ingenious contrivances.

And now it may perhaps be asked what advantage, or gain, or merit had such a system of house planning and building over that of the present day,—that is, if it had any, considering, at the same time, the multitude of disadvantages and drawbacks on all hands which such a mode of work undoubtedly entailed. We might urge that there can be, and certainly should not be, any reason whatever why houses thus designed should not be fully as good as the best that are now built, as to drainage, water-supply, lighting, heating, and so on; but the main question is, does this individuality of house-building yield enough to pay for the pains taken, and the thought expended on it? Is the mental eye-gain equal to the cost? That is the real question. We maintain that it does afford this, and that the loss entailed by the present machine-like and dull uniformity of house-planning to be seen mile upon mile all round London, and making up in the main this vast metropolis, is a tremendous evil, not in any way at present to be duly and sufficiently estimated. It would seem impossible to fully satisfy human nature with a bald utilitarianism, however perfect that may happen to be, or however fully it may seem to supply every material want. The eyes even of those who may seem all but insensible to any but animal wants need objects special to them, though they know not what, and the absence of such, though apparently unnoticed, cannot be unfelt.

#### ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the ordinary general meeting of the Institute on Monday, the 20th ult., Mr. Charles Barry, President in the chair, several donations of books for the library were announced.

M. Paul Abadie and M. Theodore Ballu (members of the Institute of France) were proposed as Honorary and Corresponding members; and Mr. W. Kidner, of Shanghai, was recommended for membership as a Fellow.

The Chairman announced that the Manchester Society of Architects, desiring to do honour to the Institute, had cordially invited Mr. Eastlake and himself, as official representatives of the Institute, to the annual dinner of the Manchester Society. The invitation was accepted and the engagement fulfilled. The most kindly expressions were used towards the Institute by the chief architects in Manchester, and three of them at once agreed to join its ranks; others would probably follow. Such of the members of the Society who had important works in hand were courteous enough to accompany the representatives of the Institute on a visit of inspection, in the course of which much that was noteworthy and valuable was seen. Irrespective of the kindness shown to him and Mr. Eastlake by their Manchester friends, he highly appreciated the courtesy manifested towards the Institute.

Mr. T. H. Wyatt said he had the honour to receive a similar invitation during his presidency, and he could fully bear out what had been said by the President as to the fraternal feelings evinced by the Manchester architects.

Mr. Samuel Knight (Associate) then read a paper on "The Influence of Business Requirements upon street Architecture," printed in our last.

In the discussion which followed,

Mr. John Hebb said he was rather afraid that Mr. Knight had been somewhat unfortunate in his illustrations, which did not at all adequately represent the architectural ability of the city. Few or none of the city buildings most conspicuous for their ability were represented by the drawings on the walls. In many cases, he ventured to think, the difficulty which Mr. Knight had pointed out of dealing satisfactorily with the superstructures of shop premises had been successfully surmounted.

Mr. Knight wished to explain that, if the drawings on the walls were not so widely representative as could have been desired (and he confessed that they were not), it was no fault of his. He had tried to obtain drawings of many of the most notable modern buildings in the city; but in almost innumerable instances he was unable to do so. Not that the architects of those buildings were unwilling to assist him; but because they were unable. He had a large pile of letters, of which the substance was:—"I should be most happy to oblige you if I could; but I assure you that I have no perspective of the buildings, and such drawings as I have are very dirty; they are in pencil, and unfit to show." Such letters would seem to show that many City architects had such confidence that their buildings would "come out" well in execution that they did not trouble to make perspectives, the geometrical elevations sufficing for their wants.

Mr. H. Dawson said Mr. Knight had alluded to the colonnade formerly existing in Regent-quadrant, comparing it with the colonnade in the Rue de Rivoli in Paris. But there was a great difference between these colonnades. In the first place, the Regent-street colonnade was very much wider in proportion to its height than that in Paris; and it should be remembered that the entresol in the Rue de Rivoli arcade so raised the height of the soffits of the arches above the shafts as to admit a very large amount of light to the shops; whereas in Regent-street the great width of the colonnade and the smallness of the height made the shops perfectly gloomy. If the Regent-street structure could only have been altered to resemble that of the Rue de Rivoli it would have been a very beautiful feature made suitable for business purposes. He regretted that Mr. Knight had spoken disparagingly of the use of Bath and similar soft stones. It was a very important thing that the old prejudice as to Bath stone should be got rid of as soon as possible. That Bath stone was perfectly capable of standing the London atmosphere he had no reasonable doubt, although many buildings in which Bath stone had been used might be pointed to as very serious failures. The reason why Bath stone—by which he meant not only the stone which came from the immediate neighbourhood of Bath, but almost all the stones of the great oolitic series—so often failed was simply that care was not taken in its selection, and that it was not laid in its natural quarry-bed. That Bath or oolitic stone, when these conditions were observed, would retain its perfect preservation, even in the London atmosphere, was proved by the exterior of Apsley House, Piccadilly, in which stone from the old Combe Down quarry was exclusively used, and in which there was scarcely to be seen a defective stone. The west front of Westminster Hall was also of oolitic stone. Such stone was largely used in Bristol and other large towns in the West of England, and was, under the conditions he had named, found to wear well. In talking of "Bath" stone, it should be recollected that the best oolitic stone did not necessarily come from Bath. The great oolitic series spread over a very large area. To what was called Corsham stone he had a very great objection, although some of it was good. During the last two or three years he had used a very good oolitic stone from the Bradford district. Farleigh Down stone had got a fearfully bad name in some quarters; but the two lower beds furnished some good stone, and if properly selected and bedded no finer stone could be used. In texture and colour it was equal, if not superior, to Portland; and where weight was not an object Farleigh Down stone was better

than Portland for many purposes. But, whatever variety of stone was used, much depended on its selection. Had the particular bed of Bolsover stone chosen by the architect of the Houses of Parliament been used we should not have to lament the premature decay of the exterior of those buildings.

Mr. Woodthorpe agreed with Mr. Knight as to Bath stone, and strongly deprecated its use for external work. Three years ago he had serious thoughts of bringing to the notice of the Institute a long list of comparatively new buildings in London which were rapidly decaying through the use of Bath stone, but he shrank from the task when he thought of the unpopularity he should incur. But he felt no such delicacy in speaking generally. Buildings which had been faced with Bath stone seemed to be subject to a disease which might be called the "stone small-pox." He could point to two churches, for instance, which had not been built twenty years, and in which the stone on the exterior had had to be almost entirely renewed from pinnacle to base. There were eight or ten varieties of stone which he could mention as being far superior to Bath or Caen stone.

Mr. H. H. Statham said it was not necessary to go to Paris for examples of the colonnade in streets. The Chester "Rows" were very nearly as broad as the pavement in Regent-street, and they were admirably adapted for shop purposes, and there was ample light. The colonnade in Regent-street was removed, he believed, not so much because it interfered with the light, as because it was supposed to give rise to scenes inconsistent with the highest theory of social life. He could not agree with one of the conclusions to which Mr. Knight's paper seemed to lead, viz., that business architecture was the apotheosis of plate glass, because plate-glass destroyed the scale of a building. The necessity for such large squares of glass as were to be seen in modern shop-fronts was more fancied than real, and he did not believe it would in the least affect a tradesman's business if shop-fronts were constructed more in accordance with architectural principles. The shop architecture of the present time afforded another illustration of the fact that architecture always represented the spirit of the day, and the spirit of to-day was "show." This got rid of, we should have better and more solid shop-architecture. As to masking ironwork "upright" by veneerings of stone in the form of pilasters, it was bad enough, but not so bad as the carrying of the superstructure of a building on iron girders masked by arches or lintels of masonry, which, to the outside observer, were really structural features instead of shams. This practice was sometimes resorted to by architects of whom better things might fairly be expected.

Mr. Jennings said, with reference to oriel or bay windows, there seemed to be a growing tendency on the part of the Metropolitan Board of Works to allow of the use of these features, as evidenced by the provisions relating thereto in the proposed new Building Act of two or three years ago. Bay windows were not only capable of being very effectively treated as architectural features, but they very often greatly added to the comfort and convenience of the inmates of a house, as, for instance, when such a window faced the south, it would not be necessary to entirely shut out that prospect with the view of excluding the sun. Mr. Knight had made no reference to the use of terra-cotta in street façades, but that material was destined in his (Mr. Jennings's) opinion to have a great influence on the street architecture of London. One great advantage possessed by brick over stone was that it was fireproof, for in most cases the walls of a brick building would not be materially damaged by fire; but in the case of a building whose walls were of stone complete reinstatement would be necessary after a fire, owing to the calcination of the walls. As to the warehouses in Cannon-street, it was stipulated by the Act passed for carrying out the work that at least one-third of the area of each façade should consist of solid brickwork or masonry, but this provision was not uniformly adhered to.

Mr. Waterhouse, in proposing a vote of thanks to Mr. Knight for his paper, said that with reference to the capabilities of the oriel window, not only as an architectural but as a utilitarian feature, an excellent example was to be seen in a block of offices known as Oriel Chambers, in Liverpool.

Professor Kerr, in seconding the motion, said that the removal of the Regent-street Colonnade was to be regretted, but its removal was mainly



brought about, he believed, by the fussiness of the tradesmen, and not because it was found that the shops were not sufficiently light. There seemed to be a great prejudice against covered ways or arcades in London. Some years ago a very good suggestion was made to form an arcade from Bond-street to Regent-street, but many of the clergymen and noblemen of St. James's predicted that the carrying out of the scheme would be so detrimental to the morality of the neighbourhood that the project was abandoned. The great question opened up by Mr. Knight's paper was whether any attempt was to be made to group the houses into long façades, or were we to be for ever content to allow every man to build his own bit of property according to his peculiar whim? Something was to be said on both sides. By having a multitude of façades, designed by different architects, a great variety of effect was obtained, and many individual façades might be well worthy of study. But was this jumble of façades to be preferred on artistic grounds to the grandeur of the Paris streets? He thought not. The architecture of London was not altogether a question of plate-glass fronts or of sham iron construction, but it was very largely a question of sky-line.

Mr. Seddon agreed with much that was expressed in Mr. Knight's paper, but he thought the Gothic school had not yet had an adequate opportunity of showing what could be done in street architecture.

Mr. Roger Smith thought that "business architecture" naturally divided itself into two sections, viz., those buildings which had shops on the ground story, and those which had not. In buildings of which shops formed part, it was desirable to make the girder or bressummer which carried the superstructure as prominent and marked a feature as possible, and in the upper stories, to have as much window space as possible, in order to give an appearance of lightness to the façade. With regard to buildings not encumbered by shops, he thought it was obvious that much more satisfactory results could be obtained from an architectural point of view. The advisability of using washable tiles for street façades should not be lost sight of.

Mr. Aitchison said that the question of window openings for business premises was one largely dependent on the widths of streets, and what would be necessary in one building would be out of place in another. One great objection to the use of iron was the cost of keeping it constantly painted. He denied that the huge sheets of plate-glass to be seen in London were essential for the display of goods or to the interests of tradesmen, for the lofty buildings of Paris had shops which were really part of the architecture of the structures, and the Parisian shopkeepers were able to display their goods in a manner quite equal, if not superior, to that adopted by London tradesmen.

The President, in closing the discussion, agreed in deprecating the use of large sheets of plate-glass in shop-fronts. With reference to what Mr. Knight had called the "semicircular Paxtonian roof," he begged to say that the Paxtonian roof was not semicircular at all. The great building by which Sir Joseph Paxton gained his fame was designed as a series of packing-cases, one upon another, without any circular roof, and it was only by the persistent efforts of his (the President's) father that a semicircular roof was adopted for a portion of the Hyde Park Exhibition building in 1851, and afterwards adopted throughout on the removal of the building to Sydenham.

#### AN EMPLOYER OF LABOUR ON CONTRACTS.

At the fifth annual dinner of the Newcastle and District Foremen Engineers and Mechanical Draughtsmen's Association, the chairman, Mr. Edward Crawshaw, said that for thirty years past his tongue had been heard from time to time in the district; but upon one subject his tongue had been silent, and that was the industrial question—the relations between masters and men, and questions of that class. If he had not been a manufacturer, he should doubtless have said a great deal about it long ago. He believed he had read every book of importance on this subject, and there was no doctrine that he had not tried to get the most truth of he could; but he had never ventured to say anything, because to say anything was to act, and he had to be cautious in what he had to say. He had derived from a work, not included by any

means in works on this subject, a few expressions which he thought might be put forward without mischief. He alluded to the work of a writer who did not deal with the present at all, nor with the conflicts of labour or capital, or any question of our own days. He referred to Sir Henry Maine, in whose work upon Ancient Law he was very much struck with certain observations. Sir Henry Maine, in speaking of ancient societies, traced the gradual growth of the custom of entering into contracts—what he called the free agreements of individuals with one another,—as gradually superseding the ancient state to which he gave the term, not patriarchal, but the scientific term of imperative; meaning that the only question to be considered was, who was to give the order, and who to obey? All progressive states gradually grew out of that, and came into a state in which that order ceased to exist, and men entered into free agreements and contracts with one another. Sir Henry Maine told them of a time when even a free market was unknown; and it was only by gradual concessions and arrangements that people were allowed to come and sell with one another in a market; everything was the subject of ordinances and regulations. Sir Henry said that some people regretted that that order of things had passed away,—that order in which it was all command on one side, and obedience on the other; but Sir Henry Maine said he did not agree with them at all; he said we had come to a state when men make bargains, one engaging to do something, and the other engaging to do something in return; and that implied a very high condition of humanity indeed,—it implied that people should enter into agreements one with another, and should faithfully keep those agreements. Sir Henry Maine showed that in the early stages of society the infraction of a contract was not thought much of an offence, because contracts were very rare, and really violations of the established order; and they could not, therefore, get into that position to have free agreements until they got the basis of one man undertaking to work for another. That was the basis of this age—that men should freely agree, and, having agreed, should keep their agreements. In this age, which he ventured to call the age of contract, there was room for not only all the virtues of mankind, but the state of things could not endure unless on both sides there was the utmost fidelity, and the religious observance of all agreements. That was the lesson he drew from Sir Henry Maine's remarkable work, and which enlightened him as to what he considered to be the true character of the age in which we lived. As to themselves and men he might say truly that the imperative age was past. We had come to the age of contracts. We made our engagements and we had to keep our engagements, and nothing had given him greater satisfaction throughout the strife that had unfortunately existed at times between capitalists and workmen in this country than the gradually growing sense on the part of workmen that, whatever the cause of quarrel might be, all contracts should be observed. That was the lesson he ventured to put before them. It was simple, but it was the best thing he could find to say. Let them understand that they were in that relation to one another, and if that relation be faithfully acted upon, then there must ensue in the first place mutual respect; and if there was mutual respect, every other feeling would spring up beside it.

#### NEW BUILDINGS FOR POOR-LAW ADMINISTRATION.

Fulham and Deptford.—At a meeting of the Metropolitan Asylums Board, on the 18th ult., a letter was read from the Local Government Board on the subject of the proposed buildings on the sites at Fulham and Deptford, for the accommodation of small-pox and fever patients, at an estimated cost of about 12,000*l*. The communication advised the erection of temporary instead of permanent buildings, as being the better course in view of the present epidemic of small-pox and of the desirability of relieving Hampstead Hospital. The General Purposes Committee had met and considered this letter, and they now reported in favour of the erection of permanent buildings, observing that temporary ones could be erected if an emergency required it. Dr. Bridges, Local Government Board Inspector, who was present, remarked that permanent buildings could not be finished till next March, and then they would be too damp

for the reception of patients. Mr. Galworthy referred Dr. Bridges to the promise in the report to erect temporary, in addition to the permanent buildings, if necessary. The report was adopted.

Salford.—At a meeting of the Salford Board of Guardians, on the 17th ult., the chairman said the committee appointed to carry out the removal of the small-pox hospital sheds from the yard of the workhouse to the land recently purchased at Hope had visited the Manchester Infirmary Infectious Diseases Hospital, and Mr. Booth, the architect, had met them. The committee had intimated to Mr. Booth that they desired that the building should be placed on the further corner of the ground on the line of the railway, so as to isolate the building from the surrounding grounds. The committee thought the hospitals should be erected in the shape of separate sheds or pavilions, each containing not more than eight or ten beds, and each being complete in itself and having rooms attached for the nurses. There would be eight pavilions, and all would be connected together by a corridor.

#### CASE UNDER THE METROPOLITAN BUILDING ACT.

##### DIVISION OF LARGE WAREHOUSES.

Scott v. Legg.—This case, in the Court of Appeal, Westminster, raised an important question under the Metropolitan Building Act, 1855. The appellant, Mr. Scott, was employed by Messrs. Charrington & Co., brewers, to enlarge their brewery. The respondent is the district surveyor, acting under the Metropolitan Board of Works. The appellant had pulled down the side wall of the building in question, with the intention of extending the building laterally.

By section 27, sub-section 4, of the Metropolitan Building Act, it is enacted (with the view of lessening the risk of, and localising, fire) that every warehouse or other building used wholly or in part for the purposes of trade or manufacture, containing more than 216,000 cubic feet, shall be divided by party-walls, in such manner that the extent of each division thereof shall not exceed 216,000 cubic feet. Old buildings are not subject to the provisions of the Act. By section 9, any alteration or addition to an old building is, to the extent of such alteration or addition, subject to the provisions of the Act. By section 28, sub-section 2, it is enacted that no buildings shall be united if when so united they will, considered as one building only, be in contravention of the Act. In the present case the area of the added building would be less than 216,000 cubic feet, but the area of the old building and the added building, without a division, taken together would be more than 216,000 cubic feet. The magistrate had ordered this area to be divided by a party-wall. For the appellant, it was contended that as the addition did not exceed 216,000 cubic feet, and as the building was only subject to the provisions of the Act to the extent of such addition, the order of the magistrate should be quashed. It was further contended that section 28, sub-section 2, did not apply, as the present was the case of extending one building and not uniting two.

The Court, however, were of opinion that, although there might not be any words in the Act which exactly met the present case, yet, looking at the working of the second sub-section of section 28, the present case was clearly within the meaning of the Act, and they dismissed the appeal.

Mr. C. Scott, on behalf of the appellant, asked for leave to appeal. He stated that the effect of the order would be to put Messrs. Charrington to the expense of some thousands of pounds, and he submitted that the question was one of importance to the metropolis generally.

His lordship said that, although the Court entertained no doubt on the point, still, as it was on the construction of a statute, and raised a matter of considerable importance, the appellant should have leave to appeal.

#### BANKS.

The erection of a new bank and manager's residence has been commenced at Boston, for the Stamford, Spalding, and Boston Banking Company, from the designs and under the superintendence of Messrs. Lockwood & Mawson, architects, whose designs were recently selected in a limited competition.

The plans of the same architects have been selected for the new bank and offices at Wakefield by the directors of the Wakefield and Barnsley Union Banking Company, in a limited competition, and the works are to be commenced immediately.

Liverpool Plumbers' Association.—On the 13th ult., the tenth annual tea party and ball, in connexion with the benevolent fund of the above association, took place in St. George's Hall. There were about 1,000 persons present. Mr. James Little, the secretary of the ball committee, read the annual report, from which it appeared that the balance from the last ball amounted to 144*l*. Out of that sum 107*l*. 16*s*. 6*d*. had been paid to widows and orphans, leaving a balance of 36*l*. 3*s*. 5*d*.



### PROGRESS OF THE PARIS EXHIBITION BUILDINGS.

If any amateur pedestrian, desirous of creating a sensation, is on the look-out for an idea, we would suggest to him the feat of walking across the Champ de Mars at the present moment, against time. We have done it, but with this exception, that we had time at our disposal. In a heavy, driving rain, with the wind not in our favour, constantly sinking in the mud, and finding

"At every deep a lower depth,"

we traversed the Champ de Mars, avoiding occasionally the slush and mire by balancing ourselves on the truck-rails or taking a series of leaps from one sleeper to another. We will not attempt a description of the vast plain, beyond saying that it is strewn all over with stones, trucks, bricks, heaps of sand, iron piping, rails, planks, and an abandoned boot deeply embedded in the clay. Heavily laden with the latter substance, we were glad to find repose in the offices of M. Houberton, the superintendent of the works, which is in the centre of this chaos of building materials.

The 700 workmen now employed are busy with the foundations of the building, which are being pushed forward with great activity. Steam power is employed in mixing the mortar, for the manufacture of which 50,000 kilos. of Portland cement are required for every 500 cubic metres of masonry, being the amount of work the contractors are obliged to perform daily, in order to complete the 60,000 metres for the 1st of next July, at which date also 13 kilometres of masonry-work for drains must be finished. During the rainy weather the men are protected by movable covered sheds. They are now erecting a powerful steam-engine to extract the sand from a quarry which lies between the site of the Palace and the military school. For the work on the Trocadero more than 1,200 men are employed, who are enabled to continue their work after dark by means of the electric light.

M. Krantz and the members of the superior Commission are greatly annoyed at the engravings of the Exhibition building which have appeared in the illustrated papers here, seeing that they only represent M. Hardy's original design, and this will be considerably modified before it is approved of by the Commission. The great difficulty appears to be the form and the dimensions of the domes, and these when decided upon may possibly necessitate the heightening of the whole of the facade, thus ensuring an imposing effect, which, in our opinion, is wanting in the original project.

Paris.

### GRANITE BUILDING.

As the propriety of substituting granite, as a building material that would resist the effects of the destructive and smoky atmosphere of London, for freestone has often been favourably discussed, and as it can now be procured in abundance, and at a moderate cost, it may be interesting, and perhaps expedite so desirable an event as its introduction, if we briefly describe some of the buildings executed in this material, which we have lately seen at Aberdeen.

It is, perhaps, necessary to premise that, with the present facilities of railway-carriage, and the substitution of flat ornamentation for carving, the beauty of which is soon begrimed with smoke, the extra cost upon freestone would be inconsiderable.

The discovery, some years ago, at Kemnay, in the neighbourhood of Aberdeen, of a beautiful white granite, has enabled the local architects to improve their buildings, by using the white, blue, red, and grey varieties in judicious contrast. Considerable beauty is thus obtained, and the necessity of introducing any large amount of carved and moulded detail much reduced. The Imperial Hotel, the Presbyterian Church, the Baptist Chapel, and other buildings are thus treated. The style of the Hotel is Venetian Gothic, with moulded jambs and arches, and some carving in the capitals. Other buildings are in the old Scottish, others in the Flemish style, with bold turrets. The Presbyterian Church, a church at Alford, and a school at Fraserburgh are in the Early English style. The last building has a beautiful spire, in two colours of granite. The church at Alford is entirely lined internally with contrasted granites, to the exclusion of plaster on the walls.

The new County Buildings in the Flemish

style, by Messrs. Peddie & Kinnear, have a fine tower, and they are executed in the beautiful Kemnay granite.

The North of Scotland Bank shows what it is possible to do in granite when cost is not limited. It has a Corinthian portico, the details of which correspond with those of the Temple at Tivoli. The workmanship and jointing are so perfect, and the material so beautiful, that this building looks as if it were executed in marble.

The cost of working granite has of late years been greatly reduced by the introduction of machinery. A style of ornamentation is now common, and comparatively inexpensive, viz.: polishing the whole surface, and then removing the polish in beautiful patterns. This answers well in the grey, blue, and red granites, and when the pattern is delicate, and the rough ground gilt, a very rich but refined effect is produced. London smoke would require the granite to be polished, and, indeed, the great beauty of granite—or marble—is only revealed by this process. The purity of effect of the Aberdeen buildings amounts almost to tameness, and it might be well, therefore, to introduce a moderate quantity of majolica of delicate pattern and subdued colour in the string panels, architraves, and cornices.

This material having a bright surface would harmonise perfectly with a wall surface of polished granite, and it is absolutely durable for external work. With the above examples of granite building at the present day before us, and knowing how subject to decay and soot-blackening all freestone buildings are in London, is not the adoption of it here well worth our attention?

### THE CHELSEA EMBANKMENT.

At the meeting of the Metropolitan Board of Works, held on the 24th ult., a report was presented by Sir J. W. Bazalgette, the chief engineer, on the settlement of the Chelsea Embankment, from which the following is an extract:—

"That the Chelsea Embankment was completed early in 1874; that up to September, 1875, its lines and levels were perfect for its whole length of 4,390 ft.; that about that period its foundations at one point became honeycombed, softened, and undermined, and the foreshore in front of it lowered by the withdrawal of the foundations of old Cadogan Pier by the Thames Conservators; that settlements on the Embankment began to be observed about this time, which have more or less injured a length of about 300 ft. of embankment nearest the pier, and that the levels and lines of the remaining 4,000 ft. of embankment continue as perfect as ever. We are now driving sheeting piles and groins in front of the toe of the embankment, and have lightened the outward pressure upon the back of the wall, and this appears to have arrested any further movement. It is proposed to protect it permanently by forming concrete counterforts at the back of the wall, which will also form piers for arches under the footway."

Mr. Roche, in moving the adoption of the report, said it would be necessary that they should confer with the Conservators of the Thames, and he suggested that it should go back to the committee for that purpose.

The report was received, and referred back to the committee for the purpose indicated.

### THE SANITATION OF HEREFORD.

This was the subject of a paper read by Mr. George Cole, city surveyor of Hereford, at the recent meeting of the Association of Municipal and Sanitary Engineers and Surveyors at Kidderminster. He said that Hereford and its suburbs contained a population of nearly 20,000, but there were not more than 10,000 or 12,000 within the district of the sewerage and water supply. The works were carried out under the direction of Mr. T. Curley, C.E., in 1854, but had been considerably extended since, under his (Mr. Cole's) direction. There was scarcely a house in the city which was not connected with the sewers; all had their water-closets, and nearly all were supplied with the sanitary syphon and trap-system, with self-closing valves, and were supplied with water direct from the mains. The surface water was conveyed into the sewers, and when running full, flushed them effectually after heavy storms. At other times they were flushed weekly by flush-wells at the end of every street. The sewers were well ventilated by open gratings in the centre of the street, varying from 50 to 100 yards apart, and no complaints had ever been made of bad smells from these openings. The sewers were further ventilated by rain-water pipes when these were not near windows, and in some instances by special 6-in. pipes. The cesspools were for the most part filled up. It had often been his lot to find two

or three at gentlemen's houses, and Mr. Cole commented on the danger arising when the imprisoned gases escaped into a house. All sewers and drains should be ventilated as much as possible, and no drain in connexion with a sewer should be allowed to enter a house without there being carried up from it a perfectly jointed ventilator. Water-closets should be made outside the external walls of a house, or at any rate adjoining them, so as to admit of free ventilation, not only from the closets themselves, but from the soil-pipes below the traps. The water-closets, in many instances, in Hereford, were not properly ventilated; and Mr. Cole remarked that the better class of society ran more danger from this source than the poor. Earth-closets had been used, but not found successful,—it might be through mismanagement. The inspector had been compelled to report them as nuisances, and had caused them to be made into water-closets. The great drawback to the Hereford sewage was, that it was made to empty itself into the Wye and polluted the stream for a considerable distance. The commercial value of sewage was, he thought, generally much over-estimated; but in an agricultural district, if anywhere, it ought to be utilised. The water supply of Hereford was pumped from the Wye, passed through filter-beds, and delivered in the usual way.

### ARBITRATION COSTS.

LOCAL BOARD OF TROWBRIDGE V. GENERAL WALKER (IN APPEAL).

At a meeting of the Board the Chairman made a cheque for 121*l.* 15*s.* in order to meet an award against the ratepayers on arbitration. General Walker claimed compensation for alleged damage occasioned by the construction of a main sewer. The General, in the first instance, claimed 500*l.*, but his agent, when before the joint arbitrator, agreed to take 200*l.*, the question of costs and other trifling matters being left for the taxing-master arbitrator.

The decision of the arbitrator fixed the compensation to be paid by the town of Trowbridge for building a public sewer under the General's field at 20*l.*, as per agreement. The town considered this somewhat a heavy verdict if assigned by a jury, and the cheque for the 200*l.* was made as above stated, when the clerk to the Board politely informed the Chairman some more figuring was required. The arbitrator had ordered 115*l.* 10*s.*, the costs of General Walker, to be added to the 200*l.* The clerk next made the not over-pleasant report that he had received a demand from the arbitrator's solicitor for his and the umpire's costs, to the tune of 121*l.* 15*s.*, and this was also to be paid by the Local Board of Health.

The Chairman, before he made out the other two cheques, observed, "He did not like it; he thought it very wrong. When a man asked in the first place 500*l.* for a public improvement, and afterwards, when all expenses had been incurred, came down through his agent to 200*l.*, it was too bad to saddle the ratepayers with the whole of those extraordinary costs in addition."

Another member of the Board observed, "Why, this is not all, for I find that the sum to be paid by us, 437*l.* in rough figures, does not include any of our witnesses' or our costs."

The Chairman, scratching his head, replied, "Dear, dear me! Don't you think the Board had better have paid General Walker his 500*l.* and have done with it?"

### STRAITS OF BROMPTON.

MARLBOROUGH-ROAD.

THE importance of this thoroughfare, to which allusion was made in the *Builder* of the 12th of August, makes it essential to recur to the subject, as since that period the two shops in Fulham-road, adjacent to the corner of Marlborough-road, have been pulled down, and the proprietor is about to erect three new houses, with shops upon a frontage of 42 ft.

Now, the necessity of seizing the opportune moment to effect an improvement induces the suggestion that as the frontage of the draper's shop at the corner is 32 ft., if 20 ft. were given to the road there would remain a frontage of 12 ft. to the Fulham-road, with a lateral frontage of 36 ft. to Marlborough-road and also ample back space for storage and the erection of a spacious and commanding house of business.

This fine and open thoroughfare, connecting the Chelsea and Fulham roads at the most central part, has been long neglected; and now that the Chelsea improvements are being so extensively carried out, it becomes essential that this point of junction should be adapted to the character of the neighbourhood and the requirements of the time. It leads from Chelsea Hospital, direct to the South Kensington Railway and Museum, and the issue would be intermediate between Pelham-crescent, Alexander-square, and Brompton-crescent. This block of two houses, 36 ft. by 32 ft., stands out over 20 ft. across the line of thoroughfare into the



Fulham-road; but the corner house was built nearly a century back, when the neighbourhood was suburban and of small comparative value; since then Whitehead's-grove, Cadogan, and other street-ranges have been erected, issuing into Marlborough-road, which has also been completed within the last century. Seeing that the corner block of buildings (two houses with 36 ft. frontage) projects over 20 ft. into the centre of Marlborough-road, obstructing at its entrance the most frequented and spacious thoroughfare of Chelsea, surely it behoves the Vestries of the two parishes wherein these houses are situated to look after public interests, to rectify so great a blot upon the south-western district, and to open and make straight the way. "Q."

#### COST OF BOARD SCHOOLS.

THE Brighton School Board, in its triennial report, just issued, gives some statistics with regard to the cost of school buildings obtained from the towns enumerated below, which were selected for a similar return made to the House of Commons about two years since, but as the figures have somewhat altered during the interval, the statistics are given by the Board corrected to the present date, so far as they could be obtained. The amounts given are the average cost per head for sites and buildings.

Board.	Sites.	Buildings.	Total.
£. s. d.	£. s. d.	£. s. d.	£. s. d.
London .....	5 0 10	9 8 4	14 9 2
Huddersfield .....	0 15 8	10 2 7	10 18 3
Bristol .....	1 9 0	6 12 0	8 1 0
Nottingham .....	3 0 0	9 0 0	12 0 0
Sheffield .....	1 15 0	8 0 0	9 15 0
Leicester .....	1 11 0	6 11 6	8 2 6
Manchester .....	3 10 10 <sup>1</sup>	9 11 2 <sup>1</sup>	13 2 1 <sup>1</sup>
Liverpool .....	1 16 0	8 17 5	10 13 5
Bradford .....	5 6 1 <sup>1</sup>	17 7 10 <sup>1</sup>	22 14 0
Leeds .....	2 12 9	9 0 0	11 12 9
Birmingham .....	2 8 11	9 4 0 <sup>1</sup>	11 9 11 <sup>1</sup>
Newcastle .....	1 7 0 <sup>1</sup>	11 5 8	12 13 2 <sup>1</sup>
Brighton .....	3 14 8	8 12 7	12 7 3 <sup>1</sup>
Halifax .....	1 17 6	9 18 7	11 16 0

#### "THE STATUS OF ARCHITECTS."

SIR,—In answer to "Civil Engineer, late Architect," allow me to state my case. I was articled to a firm of architects with a large and varied practice in the country. A premium of 120*l.* was paid down for me, and I had to give my services for five years without any remuneration whatever. At the completion of my articles I attempted to practise for some little time on my own account, but very soon got tired of the not very interesting employment of daily dusting my drawing-board and square, and then looking wistfully out of the window waiting for clients. Occasionally I broke the monotony of my life by going in strongly for competitions. Once I very high succeeded, being third in a competition of over thirty. I then tried architect's assistant, but soon found that there was plenty of work, but little or no prospect. Unlike, therefore, your correspondent, I went in for the tempting and discriminating offer of the Horse Guards, and at forty years of age I have an income of about 150*l.* per annum as a first-class military foreman of works, and in two years more shall be entitled to a pension of 1*l.* 1*s.* per week for the remainder of my life; therefore, I contend I have saved the ratepayers from the burden of my support for the remainder of my existence, whereas your correspondent shadows forth that he may ultimately become a pauper. I think you will agree with me that he had better have taken the tempting and discriminating offer. The latter part of his letter I cannot answer, but doubtless there is another side to his statement there.

F. W. E.

#### CARBURETTING GAS.

SIR,—I have read with pleasure the article by Mr. J. Gardner on the manufacture of gas in your last issue. He glances briefly at most of the processes by which, in modern times, particularly during the last few years, it was sought to enrich the quality of ordinary coal-gas, or to substitute the vapours of hydro-carbons. Nearly every one of these latter, as he justly observes, proved conspicuous failures; but he omits the mention of one process for carburetting ordinary gas with the heavy or dead oils of tar which has proved highly successful, and is the property of the Sim and Barff Company.

In proof of this statement, I would beg to refer you to the report of Professor Bloxam upon the carburettors used by that company, which he drew up at the close of a series of exhaustive experiments. In it he says that "these experi-

ments appear to justify the conclusion that the illuminating power of coal-gas may be increased threefold by burning it from a carburettor charged with dead oil"; and further on he gives fifty-four grains as the consumption of this dead oil in one of these carburettors burning 2.9 cubic feet of gas per hour.

The St. Pancras Station of the Midland Railway Company has been lighted by this method since the day it was opened in 1868; and it is beyond doubt that no other station in the kingdom can compare with this in brilliancy of lighting, combined with economy in the consumption of gas. Again, the committee appointed for selecting the best method of lighting the new Royal Exchange in Manchester have also adopted this after the most careful examination, and it has given the most complete satisfaction.

It is a fact that a process does exist by which large consumers of gas can effect a considerable saving at a minimum of cost and trouble.

FREDK. LIVINGSTONE.

#### TILING.

SIR,—In reply to your correspondent upon this subject I can, from a lengthened experience, confidently recommend that tiling should be properly laid in mortar at the top of the tile; for these reasons:—

1. The tiles lie solid. 2. The mortar will get hard, and resist the moisture, which neither hay, straw, nor moss will do; on the contrary, either will court it, and communicate it to the lath and timbers, and the result is early decay. Either will also harbour vermin, which mortar will not. Mortar will also keep out the snow and driving rain, equally if not more so than the others; because the latter in time becomes flattened, the result of continual moisture, and the draught passes over it, taking in snow or rain. If in very exposed situations, the mortar bedding fails to thoroughly resist the driving storms of rain, then point the tiles inside,—called in the country "torching." This is best done while the work is fresh, before the mortar with which the tiles are bedded is dry, as it will be done much easier, and more successfully. Lath and plaster to the underside of the rafters will certainly add to the warmth.

Tiles should not be bedded at the bottom, because in that case the frost will lift and break them. Moreover, as most tiles are at first more or less porous, if bedded at the bottom, the moisture could not find exit.

J. W.

P.S.—Do not entrust your tiling to inexperienced workmen,—a large proportion of the bricklayers know but little about it.

SIR,—In answer to your correspondent, a simple and effective method is to lath the rafters as in the usual method, and tile with nib tiles. If possible, dip the tiles into a tub of water to take off the dust, and take out the suction, then lay in the usual manner in good lime, and hair not too coarse; and, when you have laid from 4 ft. to 6 ft. up from the eaves, get under and point with the lime and hair that have pressed through the joints, and when the whole is done in this manner, and the lime and hair have got hard, put half Portland cement and half fine sand into a pail, with sufficient water to make it about the thickness of paste, keeping it stirred while applying it with a grass brush to the whole of the underside of the tiling, taking care to well fill in all the crevices and round the laths with the lime and hair.

WILLIAM PULHAM, Plasterer.

SIR,—I beg to submit the following opinion for the information of your correspondent, G. H. Palmer. First, the roof timbers should be strong, well supported, and of Gothic pitch; the double oak lath is best, and should be 3½ in. from top to top, the first lath 3½ in. from the face of the building. For brick, stone, or concrete buildings no eave-lath should be used. The under eave of ½ tiles, 7½ in. long, and tile width should be bedded, the hollow side up, solidly on the top course of brick or stone, and jointed from top to bottom, and should have 2½ in. projection from the face of the wall, and reach 1 in. above the first lath. When dormer windows or other obstructions interfere with the eave, the tiling should be carefully set out, that the bond may work correctly over such obstructions. The tiling should then be started with a half tile or straight from the right-hand side as you face the work; should in all cases be bedded on as much as it

covers of the under tiles, and jointed the whole length. The mortar should be composed of fine, clean, sharp sand, and rather more than the usual quantity of lime. The tiles should be used damp, and the bed and long joints kept as close as possible. In no case should a narrow tile be used; and to avoid this and keep the bond true, it is necessary to gauge the width of a few of the tiles, selecting wide ones as No. 1, and narrow ones as No. 2. The mediums go with the ungauged tiles. By judicious use of these gauged tiles not only may the bond be kept, but the design (when necessary) worked with geometrical accuracy. To keep tiling clean when in progress a little clean dry sand should be kept strewn upon the work. When the bed joints are fairly set they should be struck with the thick end of a lath, and finely swept along the courses with a birch-broom. When tiling is executed as above, hay, felt, boards, or moss may safely be dispensed with, without fear of snow or rain drifting in. When an air-tight job is required, the tiling itself might be rendered on the inside between the rafters.

J. H. JOHNSON.

#### THE ORIGIN OF TOBIN'S SYSTEM OF VENTILATION.

SIR,—It is perhaps hardly worth while to revive the Tobin question, but I have, whilst referring to your past volumes, come across the following passage, and cannot resist the temptation to recall it to your notice. It is an extract from a work called "The Gentleman's Stable Manual." In treating of the ventilation of stables, it directs certain openings to be made in the walls, and then continues:—"Each opening must terminate in a square tube, placed within the stable. Each tube must be 5 ft. high, having an upright position, and secured to the wall by means of holdfasts. They should be 5 in. or 6 in. square, having three sides of wood, the fourth being formed by the wall against which they are fixed. On the top of every tube fix a thick plate of zinc, well perforated with small holes." Is not this "Tobinism"? It appeared in *The Builder*, November 5, 1859.

P.

#### "USE OF CHALK IN BUILDING."

SIR,—Many years ago my client was desirous of erecting a lodge to his park, in which he had the opportunity of quarrying chalk, and we determined to construct the walls above the foundations with that material.

For this purpose chalk was dug out of the lower beds in the autumn, and stacked on its natural bed under cover, but exposed to the wind during the ensuing winter. In the spring it was dressed, and the walls were built, it being again laid on its natural bed. The external face was covered with "rough-cast." The last time I saw the lodge, a few years back, it was standing well.

The result of our experiment did not lead us to think we had adopted an economical scheme on account of the large amount of chalk necessarily quarried above that ultimately available for use.

JOHN TURNER.

#### THE LARGEST ROASTING-JACK IN ENGLAND.

MESSES. FEETHAM, of Soho-square, are at present engaged in fitting up a jack for the kitchen of the residence of the Duke of Westminster known as Eaton Hall. It is 22 ft. in length. The motive power is water, which is conveyed from the cistern to the water-wheel by a ¾-in. pipe. The wheel is 4 ft. in diameter and 5 in. in breadth, and it sets in motion six horizontal and four vertical spits. Over the wheels which communicate motion to the spits are five oil-boxes. The jack is capable of cooking about a ton of meat. It is entirely under the control of the cook, who can regulate its speed by simply turning a water-tap. The wheel will not be hidden from view, and will be enclosed in a glass case, and surmounted by an arch in ornamental brickwork. The design, with some few alterations, is that of Mr. W. Eden Nesfield, who has also supplied working drawings of the machinery.

**Death of a Belfast Builder.**—The death is announced of Mr. Thomas M'Keown, builder, of Grosvenor-street, Belfast, at the comparatively early age of 48. The contracts for the erection of the Masonic Hall, Arthur-square, and of the Theatre Royal, were entrusted to Mr. M'Keown.



## BELL FOUNDING.

In reference to the details on this subject published in the *Builder*, p. 1127, some interesting intelligence reaches us from France. Some experiments have been carried out by Messrs. de Ruolz, Montchal, and De Fontenay, on the application of the new metal of phosphuret of copper and phosphorised bronze to various industrial purposes. Phosphor-bronze is now well known as the material from which the guns of the Austrian artillery are being made. The above-named gentlemen have discovered that bells cast of this metal are much superior to those of ordinary bronze. Two bells, presented by them to the French Academy of Sciences, were tested before that society. One made with phosphuret of copper, in the proportion of  $\frac{9}{100}$ , gave sounds much superior in acuteness, intensity, and tone, to those produced by a bell of ordinary bronze,—seventy-eight parts copper and twenty-two parts tin. Its composition was also more homogeneous. A bronze alloy with the proportion of  $\frac{9}{1000}$  of phosphorus sustains friction well, and can be indefinitely recast without appreciable loss of bulk.

The clear sounds produced by glass vessels when struck are well known. The brittleness of the material, however, prevents its use for this purpose. It would be interesting to discover whether the "toughened glass" of M. de la Bastie could be made available for the manufacture of bells. If the clearness of tone is not affected by the toughening process, experiments in this direction are worth trying, and we would suggest the idea to those practically engaged in the subject.

## A CYCLOPEAN HOUSE IN MYCENÆ.

In the course of the accounts sent to London of the excavations now going on in Mycenæ, Dr. Schliemann says:—"To the south of a circular parallel double row of sepulchres my excavations have brought to light a vast Cyclopean House, which, so far as it has been uncovered, contains five chambers intersected by four corridors of 4 ft. breadth. The walls still retain here and there their clay coating, which, however, shows nowhere a trace of painting. The walls are from 2 ft. to 4 ft. 6 in. thick, and one and the same wall is in some places 6 in. to 8 in. thicker than in others. The largest room is 18 ft. 6 in. long by 13 ft. 6 in. broad, and its east side is cut out in the rock to a depth of 1 ft. 4 in. As well below this as below the adjoining room a deep cistern is cut out in the rock; the water is conducted into it by a cyclopean water-conduit, which leads down from the hill. Although there are no windows in the house, and although the scanty daylight through the doors must have been still diminished by the cyclopean circuit wall, which is only separated from the west side of the house by a 4 ft. broad corridor, yet this seems to have been the royal palace, because no building in a better style of architecture has been found yet in the Acropolis. Certainly his Royal Majesty was not comfortably lodged in such a house, but comfort being unknown, it was unmissed. On the other hand, the objects discovered in this house prove that the family which occupied it had pretensions to luxury. In one of the chambers, at a depth of 23 ft. below the surface, was found a finger-ring cut out of a splendid white onyx, with a seal, on which are incised two animals without horns. At first sight they certainly appear to be hinds, but attentive examination shows that the artist's intention had been to represent cows; both turn round their heads and look on their calves, which suck the milk from their udders. Though in a very archaic style, the incision is nevertheless well done, the anatomy of the animal is observed with accuracy, and one feels astonished how it ever was possible to do the work without a magnifying glass. In seeing the incision and thinking that it belongs to an antiquity by centuries preceding Homer, we are ready to believe that all the works of art mentioned by Homer—the wonderful shield of Achilles, the dog and the hare in Ulysses' mantle-clasp, Nestor's goblet, &c.—all existed at his time, and that he merely describes what he saw with his own eyes. There are further found in the cyclopean house perforated convex pieces of agate or serpentine, derived from necklaces—some with an incised spiral ornamentation, others with incised ornamentations of horses or deers. There was also found a formatone of jasper, showing on all six sides most fantastic types for casting gold or silver ornaments; it

had also a type for casting those frequently-found curious conical objects of a black glassy substance, with spiral lines and a perforation on each side for suspension with a string. Further on some beautiful axes of jasper or green stone, many whorls of blue stone, and a great many splendid terra-cottas, of which the large vases with two or three handles, the ends of which have been modelled into the shape of crocodiles, deserve particular attention. The whole vases are covered with representations of warriors of a dark red colour on a light yellow dead ground, wearing coats of mail, girdle belts, *knjudec*, sandals, and either shaggy helmets, with stings or prickles like the skin of a porcupine, or helmets with long crests. From the front side of the helmet always protrudes an object in form of a horn. The warriors are invariably armed with large round shields, the lower part of which is always cut out in form of a crescent; also with lances.

## MONUMENTAL.

*Edinburgh.*—It will be remembered that Mr. John Hutchison, R.S.A., had just completed, towards the end of July last, his statue of the late Mr. Adam Black, when, by an unfortunate accident, the model was almost entirely destroyed. It is stated that, in the short interval which has since elapsed, the sculptor has made good the damage, and has once more got his work nearly ready for casting. While the limbs and torso of the statue were completely wrecked, the head, in which the artist was considered by Mr. Black's friends to have secured a telling likeness, happily escaped without injury. It has, therefore, only been necessary to remodel the figure from the neck downwards.

*Denbigh, North Wales.*—On Thursday, Nov. 23rd, a statue in honour of Dr. Evan Pierce, coroner and magistrate of this town, was unveiled by Sir W. Grenville Williams, bart., M.P. The statue is of Sicilian marble, of colossal proportions, and rests on a column 50 ft. in height. The doctor is represented and clothed in a professor's gown, in the act of addressing an assemblage, the right hand resting in folds of drapery, the other holding a scroll. It is the work of the sculptors W. & T. Wills, of London. Mr. Underwood was the architect, and Mr. Jones, of Rhyl, the builder.

*Glasgow.*—Messrs. Stewart, McGlashen, & Son, of Edinburgh, have just completed a monument for erection over the grave of the late Rev. Dr. Buchanan, in the Necropolis, Glasgow. The monument takes the form of an Ionic cross, the pedestal of which is 3 ft. 3 in. in height, and the cross 8 ft. 9 in. in height, making the total height from the ground 12 ft. The whole design, which is in keeping with the early sculptured crosses of Scotland, has been executed in Sicilian marble, chastely but artistically worked. The front and edges are enriched with ornament of a Celtic type.

*Kidderminster.*—Well-nigh forty years have flown since the establishment of the penny-postage system, and only now when Sir Rowland Hill, the organiser of the reform, is in his eighty-fifth year, is it proposed to erect a statue in his honour. The movement has begun in Kidderminster, his native town, where, at a public meeting, it has been determined to raise a substantial memorial, at a cost not exceeding 2,000l.

## AN INDIAN PALACE.

The *Times of India* gives a description of Scindiah's new palace at Gwalior in which he entertained the Prince of Wales when his Royal Highness visited Central India, in the course of which it says:—"There is no doubt that the Maharajah's new palace and grounds at Gwalior are the handsomest of their kind in India. The Prince and suite pronounced this opinion, and in all probability Gwalior will, in time, attract sightseers in much the same way as Delhi, Lucknow, and Agra. The building has been erected in the Phoolbagh, and has been named Jye-in-dur-bhovan, or Abode of the Illustrious. The palace alone covers an area of 124,771 square feet, exclusive of the inner square, which is 321 ft. 6 in. by 321 ft. The palace is double-storied throughout, and in some places has three and four stories. Its highest parts measure 106 ft. from the ground. The first story is of Tuscan, the second Italian Doric, and the third Corinthian architecture. The interior of the durbar-hall measures 97 ft. 8 in. in

length, 50 ft. in width, and 41 ft. in height. Its roof is arched with solid stone slabs, each measuring 21 ft. in length, which enabled the architect to make the ribs so prominent. They run from one end of the hall to the other, and rest on each end on double Corinthian columns, which form a colonnade all round the interior of the hall. The room is magnificently painted, and the whole hall is lavishly gilded. Upwards of 3,000,000 gold leaves were used for this work. The walls have been almost hidden by gigantic mirrors, and the huge chandeliers which hang in the centre are the largest ever imported. All the glass fittings are by Messrs. Osier & Co., even to the grand staircase at the main entrance of the durbar-hall. This staircase is entirely of glass and marble. In addition to the large ruby chandelier which hangs between the wings of the staircase, statuettes and the other *objets de vertu* adorn the room, which is roofed with stone slabs, each 30 ft. in length. The room on the opposite side is roofed in the same way. The two rooms which flank the durbar-hall are furnished superbly. One is the banquet-hall, and the other contains the costly gold and jewelled throne and canopy, and the portraits of her Majesty and the Prince and Princess of Wales. This room is a sort of ante-room to the durbar-hall. Another room contains a life-sized oil painting of his highness Scindiah, and has some very costly fittings. All the apartments are beautifully carpeted. The palace itself cost a little above 11 lakhs of rupees, but the garden-walls, iron railings (all cast in Gwalior), the garden furniture, glass staircase, chandeliers, have cost nearly nine lakhs more. The area of the garden and palace park is above one square mile. The grounds are tastefully arranged, and the water runs here in a stream, falls like a crashing cataract there, and springs up in a hundred places in lively fountains. The water which feeds the garden stream comes down in a canal for a distance of fifteen miles. The whole plan of the palace and park, and the construction of them, the plan of the watershed, and the construction of the canal,—in short, every bit of the work, has been done by Major Michael Filose. . . . The Prince of Wales spoke so highly of the palace, and so often broke out in enthusiasm about the picturesque park, that after the departure of his royal visitor Scindiah made Major Michael Filose a present of a lakh of rupees."

## DRAINAGE WORKS.

*Arnold Local Board of Health.*—At the monthly meeting of this Board, held at the Public Offices, Arnold, Mr. Phipps in the chair, Mr. Fred. Jackson, of Nottingham, the consulting engineer of the Board, attended, and submitted plans and sections of the proposed sewerage works to be constructed in Arnold, and to join the main sewer in Church-street, Basford, in connexion with the Leen Valley sewerage scheme. The estimated cost of the works is 6,500l. The plans provide for flushing near Queen-street, Godling-road, and at Daybrook. It was agreed that the works be passed, and that application be made to the Local Government Board to lend the money, repayable in fifty years.

## PARTY STRUCTURES.

SIR,—I shall feel obliged if you will kindly let me have a brief reply to the following questions:—

Jones, under sec. 88, clause 7, and sec. 83, clause 7, of the Metropolitan Building Act, pulls down the party fence wall separating his garden from Smith's, and, under sec. 83, clause 6, raises same for the purpose of erecting stables on his land. Some four or five years elapse, when Smith wants to build stables, and he serves notice on Jones, under a. 83, clause 8, of his intention to cut into the party structure to insert corbels to hold plates to support his floor. Query, Is Smith bound to pay Jones for a moiety of the wall built by him in excess of the height of the old party fence wall? and, if so, under what Act?

F. H. BASLEY.

\* \* Yes. It belongs to Jones, and Smith, if he make use of it, must pay his proportion of the value of it. Jones could recover, we apprehend, at common law. As a matter of fact, a party garden wall is not a party structure under the Metropolitan Building Act.

*New Waterworks for Galashiels.*—The heavier part of the works for introducing a water-supply to Galashiels has been undertaken by Mr. James Young, R.S.M. The contract comprises the large compensation reservoir at Stantling Crag, and the clear-water reservoir at Knowes Dean, as well as the intake dam and piping from Caddon to Knowes Dean. The contract price is stated to be £7,788, 11s. 11½d. It is believed the total cost of the works will not exceed the original estimate of 30,000l.



## A NEW PARK FOR PARIS.

THOUGH possessing so many parks and public gardens, not to mention innumerable broad streets and boulevards resplendent with foliage, the Parisians are not yet satisfied. Another park is in the course of construction, and more than three hundred workmen are employed over the task. For this purpose a sum of 12,000*l.* has been at the disposition of M. Alphand; the various roads and paths are already traced, the greater part of the trees are planted, and the workmen have begun to dig out the three artificial lakes, which will be among the chief attractions of the park. The place selected for these pleasure-grounds certainly wanted improvement. Its general aspect and associations were not of the most pleasant description. The new park is situated to the south of Paris, on the hillocks which form the left bank of the Bièvre, and from whence a splendid view can be obtained of the Observatory, the Val-de-Grace, the Pantheon, Paris, and the hills which shelter the north-east of the city. The park will extend over more than sixteen hectares of land, and will be entered by four gates, giving respectively one to the Boulevard Jourdan, Rue Nansouty, Rue Gazan, and the Avenue Reille; but the principal entrance will face the prolongation of the Boulevard d'Enfer. The portion of this thoroughfare, extending from the Sceaux Railway Station to the park, will henceforth be called the Avenue de Montsouris. The park also will be named after the quarter on which it is laid out, notwithstanding the dismal significance of the word. Montsouris was formerly a miserable little hamlet called Mange-Souris; for the inhabitants were so poor that they were described as feeding on mice. It was here also that the celebrated giant or brigand Isore, the hero of so many romances, was buried in 1664. His tomb, one of the curiosities of Paris, was reconstructed by Antoine Cabot in 1777. This place, indeed, has always been associated with the burial of the dead. All ghosts and goblins, giants and other mystic personages of ancient legends are generally made to issue from the Tombe Isore, and the superstitious Parisian looks in the direction of Montsouris when he anticipates some supernatural apparition. Nor is it difficult to account for these delusions. The chief entrance to the catacombs is at Montsouris, and it is here that all the bones collected from the Cimetière des Innocents and other burial-grounds were brought and deposited.

These gloomy associations will, however, be soon obliterated by the exceptional attractions of the new pleasure-grounds. Besides the beauty of the flowers, and the verdure of the park, visitors will be able to examine the Palais du Bardo, which was one of the curiosities of the Exhibition of 1867, and now serves as an observatory. This and other observatories close at hand have been established by the War Department to be used as special laboratories, to facilitate geographical studies among naval and military officers. Altogether, therefore, the Parc de Montsouris will be to the Parisians who live south of the Seine what the Parc des Buttes de Chaumont is to the inhabitants of the northern districts. So much has already been done to increase the beauty, the luxurious aspect, and sanitary condition of the western or wealthy quarters of Paris, that we cannot but welcome this effort to place a garden of health in the midst of the poorer dwellings of the industrial classes.

## BUILDERS' BENEVOLENT INSTITUTION.

THE forty-sixth election of pensioners on the funds of this Institution was held on Thursday last at Willis's Rooms, St. James's, Mr. Charles B. Waller, president, in the chair. There were two vacancies,—one for a man and one for a woman. The following is the list of candidates, with the number of votes recorded for each, viz.:—Henry Atkins (third application), 4,522; J. T. Brown (first application), 838 (including 52 votes allowed in consideration of Mr. Brown having been a subscriber to the Institution for thirteen years); Eleanor Winter (second application), 2,098; Susannah Webb (second application), 1,644; Elizabeth Thorn, 1,277; and Ann Noyes, 193. The successful candidates were therefore Mr. Atkins and Mrs. Winter.

Notes of thanks to the scrutineers and the chairman concluded the proceedings of the election, after which Mr. Thomas Stirling was presented with a piece of plate, subscribed for

by the members of the committee of management, in recognition of the zeal and efficiency with which he discharged the duties of honorary secretary to the Institution for a period of several months after the death of the late secretary, Mr. A. G. Harris.

At the next election of pensioners, there will be a larger number of candidates elected.

Mr. F. W. Keeble has accepted the position of hon. secretary to the annual ball of the Institution, which will take place on the 18th of January, 1877.

## SURVEYORSHIP ITEMS.

**Chiswick.**—At a meeting of the Chiswick Improvement Commissioners, held on the 22nd ult., Mr. H. O. Smith was elected engineer and surveyor, at a retaining salary of 300*l.* per annum, with no restrictions as to private practice, but to hold no other public appointment without their consent in writing. There were ninety-six applicants, and these were reduced to eight, from which the final selection was made.

**Croydon.**—From six candidates who had been selected by the General Purposes Committee of the Croydon Local Board of Health, Mr. Laffon has been chosen to fill the office of Assistant Surveyor.

## A NEW HALL IN KENSINGTON.

At the vestry on Tuesday night, Sir W. Fairfax in the chair, a report was brought up with reference to particulars for the guidance of architects in designing plans for the new building to be erected for the vestry and its officers. The style of architecture agreed upon is *O'saic*; the front walls may be brick and stone, but stucco is not to be used. The estimated cost (exclusive of furniture) is not to exceed the sum of 18,000*l.*

Mr. Boucher wished to know what the vestry meant by the term "*Classic*."

Mr. Davis said it was put in to exclude Gothic. After some discussion with regard to the style of architecture, it was resolved that it should not be either Gothic or Elizabethan. With a few verbal alterations the particulars were adopted.

## THE NEW BRIDGE OVER THE REGENT'S CANAL, CHALK FARM-ROAD.

SIR,—We notice the description of the above bridge in your issue of the 18th ult., and request you to be good enough to notice in your next that this firm supplied and erected the whole of the iron-work. It is not correct to say, "There are mains formed in the girders 34 in. diameter."

The novel feature of utilising the two main girders to serve as gas-mains emanated from, and has been carried out by, us. We have constructed these girders so as to be quite gas-tight; they, of themselves, serve as gas-mains, and the passage in them for the gas is 3 ft. by 1 ft. in the clear, = 3 ft. square in area.

MATT. T. SHAW & CO.

## RICHMOND PARK.

SIR,—I have read your article on Richmond Park, in last week's *Builder*. I think it quite time that the Office of Works had the entire control of the park, and that preservation of game in a public park so near London was abolished. The enclosures should be thrown open to the public. Certain portions of the park should also be set apart for football, cricket, and other athletic sports. I trust you will assist to obtain such a desirable change in the management.

A RICHMONDITE.

## PHILADELPHIA EXHIBITION AWARDS.

SIR,—In your last issue is a letter signed "G. H.," which speaks of the productions of certain particularised exhibitors. This would have been of more value had the writer given his name, which would possibly have satisfied as to his judgment and claim to speak with authority on this subject. We observe that our exhibit is not referred to by your correspondent, and we take a course unusual with us, in asking your permission to state that we are recipients of two medals for metal work; that a portion of our exhibit has been purchased by the Pennsylvania Museum and School of Art, and that that Institute has signified its desire that some further portion thereof may be placed on loan with them.

HART, SON, FEAUD, & CO.

**The District Surveyorship of Bethnal-green (East).**—This office, vacant by the death of Mr. R. Culver James (as announced in the *Builder* last week), will be filled up on Friday next, the 8th inst., by the Metropolitan Board of Works. There are many candidates for the appointment.

## ACCIDENTS.

A TELEGRAM received at New York, on the 19th ult., announces that the floor of a crowded theatre at Sacramento, in California, fell in on the previous night. Seven persons are said to have been killed and 100 injured, many of the latter fatally.

On the 17th ult., while a number of men were at work upon a scaffold on the spire of the new Wesleyan Church, Windsor, 90 ft. high, one of the supports broke, precipitating three men from the roof. Two were dreadfully injured, one, it is feared, fatally. Both were removed to the Royal Infirmary.

## CHURCH-BUILDING NEWS.

**Warthill.**—The new church of St. Mary, Warthill, near York, has been consecrated by the Archbishop of York. The church has been erected from designs and under the direction of Mr. J. G. Hall, of Canterbury, and is in the early Geometrical style of architecture. The building consists of a nave 40 ft. long by 19 ft. wide, chancel 18 ft. long by 16 ft. wide; on the north side is the vestry, and on the south side a tower, under which is the principal entrance to the church. The roof to the nave is open timbered, stained and varnished, with moulded ribs resting on stone corbels. Sitting accommodation has been provided for 120 persons. The exterior of the building is faced with grey or mottled brick, with Yorkshire stone dressings to the buttresses, body of tower, and windows. The roofs are covered with thick Welsh slates. The tower contains three new bells, cast by Messrs. Warner & Sons, of London. The whole cost of building the church has been borne by Mrs. and Miss Agar, of Brockfield, near York. The contractors were Mr. Clark for the masonry, Mr. Rookledge for all the joinery and carving, Mr. John Nichols for bricklaying, and Mr. Hodgson for the coloured and plain glazing.

**Felkirk.**—The parish church of Felkirk, near Barnsley, has been re-opened for divine service, after having been closed for twelve months. During that period it has undergone a process of renovation. The galleries have been removed, and the high-backed pews of the nave and aisles replaced by open benches in oak. The walls were in a tolerably good state of repair, and it has not been found necessary to rebuild any portion of them. The aisle roofs have been completely restored in substantial oak. The pulpit, which was formerly in the nave, has been placed against the north pier, and the reading-desk on the opposite side. A carved oak lectern, the gift of Mr. Ramsbottom, stands midway between them, at the top of the nave. The total cost of the alterations amounts to 2,600*l.*

**Bryn Eglwys, Denbighshire.**—The parish church of Bryn Eglwys was re-opened on the 31st ult., after restoration under the direction of Mr. Arthur Baker, architect, at a cost of nearly 1,000*l.* Bryn Eglwys is situated in a romantic valley at the extreme end of the Clwydian range of hills. The old church and private chapel connected therewith, which is the property of the Yale family, of Plas yn Yale, date back beyond the Conquest.

**Birmingham.**—An effort is now being made to restore, or rather to completely rebuild, St. Luke's Church, Bristol-street, Birmingham, any attempt to patch or repair it being declared to be utterly useless. In its present condition it is said to be positively dangerous, and both Mr. Chatwin, the architect, and Mr. Briggs, a builder, who have been consulted on the matter, agree that nothing short of taking it down will effectually meet the case; for although erected only a little over thirty years ago, the sandstone of which it has been constructed is completely decayed. Mr. Chatwin has prepared designs for a new structure, and these having been fully approved of, all that is now required is the necessary amount of money for carrying on the work. Altogether the rebuilding will cost about 7,000*l.*

**St. Mary Cray.**—The chancel of the parish church of St. Mary Cray has been re-opened, after restoration. The church, which has many points of interest, and dates from about the end of the thirteenth century, was partially restored in 1862, but much remained to be done in the chancel. In June last the Ecclesiastical Commissioners undertook to completely restore the chancel, and this has now been done under the direction of Mr. Ewan Christian, the Commissioners' architect. The south wall was found so rotten (the church is built of flint throughout)



that it had to be rebuilt all but about 100 square feet; in this part has been opened out a perfect hagiocope. The works have been carried out by Mr. Bridge, builder, of Maidstone.

**Epsom.**—Christ Church, Epsom, was consecrated by the Bishop of Winchester, on the 17th ult. The church has been erected on a piece of waste ground at Epsom Common, in the manor of Horton, and is situate about three-quarters of a mile to the south-west of the town. It is built in the Decorated Gothic style, of rough whole flints, dug from the neighbourhood, with Bath stone quoins and dressings, and measures 120 ft. by 45 ft., intended to be increased at some future date to 56 ft., by the addition of a south aisle, and a tower has yet to be constructed. The sittings number 464, all plain and open, and of which 400 are to be free. The flooring in the body of the church is plain wooden, save the aisles, which are paved with Godwin's quarry tiles, while in the fine chancel encaustic tiles are laid down. Nearly the whole of the fittings, including an organ, built by Hill & Sons, have been given by members and friends of the congregation. The edifice was designed by Mr. Blomfield, and the builders are Messrs. Adamson & Sons, of Putney. The total cost of the structure has been 6,500l.

**Pebmarsh.**—The parish church of St. John the Baptist, Pebmarsh, has just been restored at the hands of Mr. Harcourt Rannacles, of Halsted. The church formerly belonged to the Priory of Clare, in Suffolk, founded by Eluric, son of Wighar. In the reign of Edward the Confessor, Gilbert de Clare, son of Richard Fitz Gilbert, Earl of Brion, gave the Priory with all its Prebends to the Abbey of Bee, in Normandy, about the year 1090.

**Polegate.**—The new church of St. John, in the hamlet of Polegate, Sussex, was opened for worship on the 10th ult. It is built externally of Kentish rag, Bath stone being used for the facings and tracery of windows, the internal walls being of red brick. The roof, an open timbered one, is covered with local red tiles, and a tower and spire are situate at the north end, the lower part of the tower forming a porch entrance. The extreme inside length is 82 ft., and width, 26 ft., the chancel being 24 ft. by 20 ft. The height of the nave is 36 ft., the chancel 30 ft., and the spire 63 ft. The plan consists of a nave, with open seats to accommodate 210 persons; a chancel, fitted with choir-stalls, &c.; a vestry adjoining the chancel, with space for an organ at the back of the choir-stalls on the south side. The aisle and open spaces of the nave and the floor of the chancel are paved with Minton's tiles. The heating is effected by means of Gurney's patent stove apparatus. Messrs. Blesley & Spurrell, of Eastbourne, are the architects, and Mr. Peerless, of the same town, was the builder, the total cost being 2,620l.

**Hyssington.**—In the summer of last year it was determined to pull down the old church and to build one as nearly as possible on the same site. The old church was a plain rectangular building, with rubble walls, 5 ft. thick, without a single architectural feature worthy of preservation. The roof was covered with heavy old stone tiling, which was rapidly breaking the back of the church. The interior consisted of a nave and belfry, divided by a lath-and-plaster partition, and the arrangement and fittings quite accorded with the generally dilapidated state of the building. The new church is in the Late Decorated style, and consists of nave and chancel under one roof, and a small vestry. The distinction between the nave and chancel is marked by a buttress, and the chancel is further distinguished by a string-course. The old bells (one bearing the inscription *Sancta Etheldreda ora pro nobis*) have been fixed in a double bell-cote. Internally, the chancel roof consists of carved rafters of pitch-pine, boarded diagonally on the upper side, and the nave roof is similarly boarded on the top of plainer rafters. The chancel floor is laid with Godwin's encaustic tiles, and the nave floor with Corndon flag. The old carved oak Jacobean pulpit and the hexagonal font have been remounted and retained, at the expense of the late vicar. The new church was consecrated on the 24th ult.

**Chudleigh Knighton (Devon).**—The little church of St. Paul, built by Sir G. G. Scott, R.A., some six-and-thirty years ago, has just been restored. Cruciform on plan, and consisting of nave, chancel, and transepts, this church was built entirely of flint, with limestone dressings. It is in the Early English style, all the windows being lancet-headed ones. A general renovation being

necessary, designs were prepared, and have been carried out under the supervision of Mr. R. Medley Fulford, architect, Exeter. The various defects which three dozen years have brought to light in the building have received careful attention, and the whole of the body of the church has been re-seated throughout with open pitch-pine benches. A new pulpit is in the same material. There is a low chancel-screen with traceried panels and carved terminations, also in pitch-pine, and forming a unique and good feature. The avenues are laid with encaustic tiles. The communion-table has been elevated, and is now reached by four steps. Behind it is a carved Bath stone reredos. This is divided into three compartments, the central one being gabled and further ornamented by the introduction of a large foliated cross in polished alabaster. The backs of the three panels have sgraffito work introduced into them, and this style of ornamentation is, we believe, to be used in other parts of the church. A new stained glass window over the table is by Mr. Drake, of Cathedral-yard, Exeter. The carved work and the reredos are by Mr. Harry Hems. The contractor for the whole of the works was Mr. John Mills, builder, of Newton Abbott.

**Wanstrow (Frome).**—The parish church of Wanstrow, near Frome, has been recently repaired and altered to a considerable extent. New roofs have been put throughout (the church in plan consists of nave and chancel, north and south transept, tower, chancel, aisle, and a new vestry), the west wall and the chancel arch taken down and rebuilt, the chancel rebuilt, and a great portion of the south transept and chancel aisle also. The tower being modern has scarcely needed any repairing. The roofs are of fir timber, with wagon-headed wood ceilings under, panelled and cusped, the nave and chancel ceilings being the most ornamental. Externally, the new roofs, like the old ones, are covered with the stone tiles so characteristic of the neighbourhood. The whole of the old pews, also west gallery, have been removed, new floors put, and open square moulded-end benches put. The church will now accommodate 160 worshippers. The walls have also been re-plastered. The gangways of the nave and north transept have been paved with adamantine clinker bricks, banded and bordered with slate. The chancel, south transept, and chancel aisle are paved with encaustic tiles. In the new chancel a great deal of the jambs of the old windows has been re-used, and the ancient piscina discovered embedded in the walls has been reinstated, in proper position. A small vestry has been added on the north side of the chancel, roofed by a lean-to. Traceried wooden screens divide the south transept and chancel aisle from the rest of the church. New doors of different design have been placed to each entrance. There is a new pulpit, with perforated oak panels in the upper part, and a Ham-hill stone base; the font, with its square moulded and carved panels on each side, is of Corsham Down stone. In style, the church was Early Decorated, the unusually low pointed segmental arches being remarkable. The church is warmed by one of Porritt's underground stoves. The works have been carried out by Mr. John Vallis, builder, of Frome, Mr. Ferrey, F.S.A., and Mr. Edmund B. Ferrey being the architects. The total cost has been about 1,500l.

#### WINCHESTER HOUSE.

THE recent purchase of this building by the Government was announced in No. 1750 of the *Builder*. In the recent biography of the late Dr. C. R. Sumner, D.D., by his son, it is explained how this house became the property of the bishop, and his town residence as prelate of Winchester. In Mudie's "History of Hampshire," vol. i., pp. 63-4 (1839), it is stated that "The palaces erected in Winchester have been subject to the same fluctuation and decay as monasteries and fortified castles. To the southward of the ivy-clad remains of Wolvesey Castle, and near the chapel, the structure of modern date, Bishop Morley began in 1684 a splendid palace for an episcopal residence. The building proceeded slowly, and was completed by Bishop Trelawny, the successor of Morley; and after his demise, in 1721, seven years after, the laying of the foundation, and scarcely ten years after its completion, it was partially in ruins. The bishops having preferred the castle of Farnham as their principal country residence, Bishop Morley's palace has disappeared, except one of its wings, used as an occasional residence

of the prelate." Mr. Joseph Moser, A.D. 1803, a notable antiquary, stated that at Bishop's Sutton, A.D. 1773, were ruins of a large building supposed to be the walls of a former palace of the bishops of Winchester, one of ten palaces or manor-houses, at Wolvesey, Southwark, Waltham, Marwell, Esher, Farnham, Wargrave, Taunton, and Highclere. Waltham Palace, at Bishop's Waltham, is described and engraved in Warner's "History of Hampshire," vol. i., p. 266, and in Mudie's, vol. ii., pp. 170-2. It was founded by Bishop de Blois, in the middle of the twelfth century. William of Wykeham repaired and rebuilt this edifice. The remains of the hall indicate a length of 66 ft., a breadth of 27 ft., and a height of 25 ft. In Warner's work, the remains of Wolvesey Castle, and the chapel of Wolvesey, are engraved (two views) and described (vol. i., pp. 270-1) at length.

At the commencement of the twelfth century, Giffard, Bishop of Winchester, erected a residence in Southwark for this see, which had a park of sixty or seventy acres. A.D. 1642, this palace was abandoned, and A.D. 1663-4, Bishop Morley purchased a new Chelsea mansion from the Duke of Hamilton, at the price of 4,250l., pursuant to an Act of Parliament. A.D. 1821, Bishop Tomline, by virtue of an Act of Parliament, sold this residence for 6,000l., described and engraved in the *Gentleman's Magazine*, vol. xcii., p. 516; and when Dr. Sumner became bishop of this see, A.D. 1827, the residence in St. James's square was bought with the proceeds of sale and of timber. Until now it has remained as the town residence of the bishops of this diocese. Wolvesey and Farnham Castles were erected by Henry de Blois. At Wolvesey Queen Mary lodged before her marriage with Philip of Spain. It was destroyed by Sir W. Waller's army during the civil war. See Milner's "History of Winchester," vol. ii., chap. v.; and Leland, *Itin.*, vol. iii., p. 99. In Mr. Cassan's "Bishops of Winchester," vol. ii., the palaces at Waltham, Farnham, Winchester, Chelsea, and Southwark are described at length. Farnham Castle, built by De Blois, belonged to this see originally, A.D. 1129. It was seized by Louis, the Dauphin of France; but shortly afterwards Henry III. recovered the castle. In 1642 it was injured by the rebels, and subsequently it was dismantled as a fortress. The *Gentleman's Magazine*, N. S., vol. ii., p. 372 (April, 1839), contains an engraving of another Winchester House, then recently destroyed. But this ancient building had belonged to the Paulets, the site having been given by Henry VIII. to the 1st Marquis of Winchester. The land had belonged to the Austin Friary until the Reformation. The outer gate shown in this view, with its shell-formed pediment, is stated to have been an example of the massive entrance-porches to old London mansions. These buildings were on the west side of Broad-street, and on the south side of Winchester-street, in the City of London. The *Gentleman's Magazine*, vol. lxi., p. 1160 (1791), and vol. lxxiv., p. 629 (1814), contain an engraving of Southwark Palace, showing that it must have been an extensive building. Farnham Castle is engraved in Manning and Bray's "History of Surrey," vol. iii., pp. 134-5. The three viewshew, respectively, the castle, the keep from the south-west, and an inner room, then (1814) used as the servants' hall.

CHR. COOKE.

#### Books Received.

*The Complete Practical Machinist.* By JOSHUA ROSE. Philadelphia: Henry Carey Baird & Co. London: Sampson Low, Marston, Searle, & Rivington. 1876.

THIS is essentially a book for those who are usually called "practical" men,—workmen,—mechanics. It treats of tools and how to use them, in lathe work, vice work, drills, taps and dies, hardening and tempering, &c., illustrated by many excellent engravings; and thus far it conveys instruction how to do good work in a machine-maker's shop. Towards the end of the book is an explanation of the action of the slide valve, which is very plainly stated.

*A Treatise on Lathes and Turning.* By W. HENRY NORTHOTT. 2nd Edition, with 338 Illustrations. London: Longmans, Green, & Co. 1876.

THE author is a member of the Turners' Company. In addition to numerous illustrations of parts of machines, and of tools, views of complete lathes are given from photographs furnished to the author by Sir Joseph Whitworth & Co.



Messrs. Fairbairn, Kennedy, & Naylor, and other eminent makers. Besides the ordinary operations of turning, boring, drilling, planing, wheel-cutting, &c., ornamental turning, cutting, and carving, are treated of to some extent; and the author promises another volume which is to be devoted exclusively to examples of plain and ornamental turning.

*The Timber Merchant's and Builder's Companion.* Third edition. By WILLIAM DOWSON (Timber Merchant, Hull). London: Crosby Lockwood & Co. 1876.

CONTAINS new and copious tables of the reduced weight and measurement of deals and battens of all sizes, from one to a thousand pieces; also the prices per foot relatively to the prices per Petersburg standard hundred; and other useful and valuable information concerning foreign timber.

*Wood Conversion by Machinery.* By JOHN RICHARDS, M.E. London: J. & W. Rider. 1876.

SAWS and sawing are what the author treats chiefly upon. He offers also some useful remarks on foundations for machines, and enumerates the inventions of Sir Samuel Bentham pertaining to wood-cutting, and adds some remarks on longitudinal and transverse planing. The articles are reproduced from the *Timber Trades Journal* of 1875.

### Miscellaneous.

**The Philipson Orphanage, Newcastle-on-Tyne.**—The Philipson memorial building, erected at the Moor Edge, for the boys of the Northern Counties Orphanage, and named the Philipson Memorial Orphanage, has been opened. The building has been erected mainly at the cost of Mr. Hilton Philipson to perpetuate the memory of his late mother (the wife of Mr. R. P. Philipson, the Town Clerk of Newcastle). The new building has cost about 10,000*l*. The building, which was designed by Mr. G. T. Redmayne, of Manchester, is simple Gothic in style, and it is built of local grey bricks, with a slightly red brick in bands of one brick every four courses. The building has round-arched window heads, with stone labels and string courses, and moderately steep-pitched roofs, broken up with dormer lights to the top story. It has a frontage of 123 ft., and a tower rises at the south-west corner to a height of 20 ft. On the ground-floor there are school, class, and dining rooms, committee's room, matron's room, apartments of the master and assistants, and kitchen, offices, lavatories, &c. There are two school-rooms; one 34 ft. 6 in. by 18 ft., and the other 37 ft. 3 in. by 20 ft. The dining-hall is 34 ft. by 23 ft. The contractors for the building were Messrs. Lowrey & Scott, and Mr. Yates has acted as clerk of the works.

**Wren's First Church.**—Under the order of the Ecclesiastical Commissioners, the Church of St. Dionis Backchurch is now being demolished. The church, named after Dionysius the Areopagite,—who, converted by St. Paul at Athens, travelled on to France, where, after his martyrdom, he was adopted under the name of St. Denias the patron saint,—was the first church completed by Sir Christopher Wren after the Great Fire of London. Originally built in 1288, the present edifice, which stands in Fenchurch-street, was completed in 1674, its length being 66 ft., the breadth 70 ft., and the tower 90 ft. in height. Grinling Gibbons carved the pulpit, and according to Godwin's "City Churches," it possesses in the vestry (and these were seen yesterday) four of the large syringes or squirts which were used by the City forefathers for the extinction of fires. They are about 2 ft. 3 in. long, and are attached to straps which cross round the body of the person using them. These will be conveyed to the Guildhall Museum. The monuments and tablets will be removed to the church to which the parish is affiliated, and the bodies removed to Ilford.—*Times*.

**Technical Education for Bricklayers.**—A correspondence between members of the Artisans' Institute, St. Martin's-lane, and the Institute of Architects, in type, has been cancelled, having appeared elsewhere. The class asked for some encouragement from the Institute in the way of certificates and diplomas. The Institute replied that it was established for purely professional objects, and could not entertain the idea.

**Tinsley's Improved Bedstead.**—Mr. Wm. Tinsley, the well-known publisher, not content with the elevation of the mind, his more immediate object, has been trying his hand, and with success too, at the elevation of the body. Observing, at hospitals and elsewhere, the labour and pains required at times to raise a patient in bed to a more upright position, he has devised and patented a very simple arrangement by means of which this is effected in "the twinkling of a bed-post," as people say. By a turn or two of a handle the upper part of the body may be raised to an almost upright position, the bed-clothes being undisturbed and following on the body, and it may be lowered again as rapidly and as easily. There must be many cases in which such an arrangement, cheaply applied, would be a boon. Nor, as it seems to us, is it the sick or wounded alone that might wisely take advantage of the invention. Persons who deem it advantageous to take their breakfast in bed, read their letters and make arrangements for the day, before getting up, would find Tinsley's elevator a great comfort at little cost.

**The New Hall for the Phrenological Museum, Edinburgh.**—An addition to the Watt Institution, Edinburgh, comprising, together with further class-room accommodation, a large hall for the Phrenological Museum, in Surgeons'-square, is nearly completed. The building is in the Palladian style, but the architect (Mr. David Cousin) is stated to have imparted a French feeling to the details. On the ground-floor is the Phrenological hall; on the first and second floors are class-rooms, with retiring-rooms, for the lecturers in the School of Arts; while the whole of the upper flat is set apart as a drawing-class hall, being excellently lighted from the roof, as well as from either end. All the new class-rooms will be entered from the great staircase in the building, erected for the School of Arts two or three years ago. The front of the Phrenological Museum is enriched by a large oriel window, which forms a prominent feature in the design.

**Additional Dock and Wharf Accommodation at Runcorn.**—On the 14th ult. the Weston Canal, which connects Runcorn with Weston Point, and is about one mile in length, was re-opened, it having been closed for several months for the purpose of being deepened and made into a ship canal. It has now an average width of 100 ft., and vessels drawing 15 ft. of water are able to pass along it. This canal will afford extra wharfage space of more than a quarter of a mile in length. It is being fitted with five wooden stages and steam cranes, and a high-level tramway is in course of erection, so that the loading and unloading of vessels will be greatly expedited. Since the transfer of the Runcorn and other property to the Bridge-water Navigation in 1872, upwards of 50,000*l*. has been expended in improvements at the port, which has had the effect of materially increasing the trade.

**The New Monster Clock at the Crystal Palace.**—The monster clock by Messrs. E. Dent & Co., which has been in course of erection during the past six months at the south end of the Crystal Palace, is now completed and in working order. This clock is almost a counterpart of the great Westminster clock (which was built by the same firm), with the exception of the striking and chiming apparatus, and the dial is the largest ever yet constructed, being 40 ft. in diameter, or nearly 1,300 square feet in area. The diameter of the Westminster clock is but 23 ft. The hands, with their counterpoises, weigh nearly a quarter of a ton; the minute-hand measures 19 ft. in length, and moves  $\frac{1}{2}$  in. at every beat of the pendulum. The distance travelled by the point of the minute-hand is nearly four miles a week. During seventeen days of observation the variation was eight seconds only. The face of the clock has been designed by Mr. F. Fenton.

**Norwich School Furniture.**—Messrs. Colman & Glendinning, of Rampant Horse-street, Norwich, have just erected an additional manufactory on Chalk Hill-road. The building is composed of Portland cement concrete, and has three stories—the upper floor being used as a show-room, the second being devoted to the carpenters and machinery, and the ground floor to the blacksmiths. The manufactory is 113 ft. long, 69 ft. wide, and 40 ft. high to the wall-plate. The whole building is stated to have been designed and carried out under the direction of Mr. J. Holmes, foreman to Messrs. Colman & Glendinning.

**New Horse Repository, Canterbury.**—A new horse repository was opened at Canterbury on the 11th ult. It has been erected from the drawings of Mr. John Green Hall, architect, Canterbury, the builder being Mr. Frank Fetherstone, of Littlebourne, for a contract sum of 2,167*l*. The walls are of the red Canterbury brick, and the roof of Bangor slates, lighted by skylights. The building is fitted with iron mangers and racks cast by Messrs. Drury & Biggleston, ironfounders, Canterbury. The buildings consist of four separate stables, each 38 ft. long, 28 ft. wide, and 22 ft. high up to the collar, giving to each horse 1,600 cubic feet of breaking space. Also a carriage-house, 36 ft. long by 24 ft. wide, with office and rostrum at the end.

**New Literary Institutes in the North.**—On the 14th ult. an interesting ceremony took place at Skinningrove, a large and thriving mining village on the Cleveland coast, below Saltburn. Messrs. J. W. Pease & Co. are the principal owners of the place, and with their accustomed liberality they have provided for the intellectual wants of their workpeople, who are compelled to live away from the advantages of towns, by the erection of a literary institute on the same plan as that just opened at New Marske. The total cost of building and furnishing has been about 2,857*l*., and the work has been carried out, as at New Marske, from the plans and under the superintendence of Mr. Carrington, Messrs. Pease's architect.

**The Midland Railway.**—At the annual dinner of the engineers connected with the Midland Railway at Derby, held recently, the chairman gave, as an instance of the magnitude of the company, the mileage of railway, canals, and tramways, being, in round numbers, about 1,500, the coal consumed for locomotive power amounting annually to 600,000 tons, and for the conveyance of passengers and goods there were 31,000 vehicles. These in line would form a train the rear van of which would be in St. Pancras Station, and the front van six miles north of Derby, with 11½ miles of locomotives in front; and the number of men employed to work the line is upwards of 36,000.

**Drainage at Whitby.**—At a special meeting of the Whitby Local Board, a few days since, the plans and report of Mr. Mansergh, C.E., for the construction of a new system of drainage, at a cost of 34,000*l*., were taken into consideration. Mr. Stevenson presided. The meeting considered that the estimated cost was a serious impediment to the execution of the works, and that the scheme was further defective by reason of the length of the main tunnel to the outfall at Saltwick, the syphon across the harbour, and the non-utilisation of present drains. Mr. Mansergh will therefore be requested to modify his scheme so as to make its execution practicable for about 10,000*l*., failing which premiums will be offered for the best plans.

**Entrances to Theatres.**—We have frequently noticed the bad arrangements for admission to theatres. As we said recently (p. 945, ante), in regard to the crowd waiting, the "guardian of the streets remains within, while the people press outside," though to do so might seem "a folly in a man, and in a woman a negation of modesty." An instance occurred at the Haymarket pit-door on Tuesday night, when a young gentleman was surrounded by thieves, and a valuable watch and chain were taken from him. The *modus operandi* is to pounce the hands, and knock the hat over the eyes, while the adept thief takes the plunder. What is the use of a policeman inside calling out "Take care of your pockets!"

**Sewer Ventilation at Carlisle.**—Mr. Rawlinson has confirmed the advice given to the Carlisle Urban Sanitary Authority by their medical officer and others to convert the sewer manholes into ventilators, and allow the deadly gases that accumulate in these subterranean storehouses of disease to escape into the open air. The *Carlisle Journal* anticipates the best results from the adoption of Mr. Rawlinson's suggestions. The Carlisle sewers are said to be well constructed, but they were made in the early days of sanitary engineering, and require to be improved in accordance with the results of subsequent experience.

**Proposed New Pump-room at Tanbridge Wells.**—A company is in formation at Tanbridge Wells for the erection of a pump-room. The capital of the company is 6,000*l*., and plans for the building have already been prepared.



**A Petroleum "Pipe-line."**—An American correspondent says that one of the principal engineering projects claiming attention in Philadelphia is the proposed construction of a "pipe-line" for the conveyance of oil from the oil regions to the Atlantic seaboard, a distance of three hundred miles. It is proposed to construct this line and force the petroleum through a four-inch ordinary main. This is no experiment, as pipe-lines of great length are already working satisfactorily. The line will be laid 30 in. under the ground, over mountains and down to valley stations, where the distribution of the labour of forcing is carried on. When complete the capacity of this pipe-line will supply Philadelphia with no less than 1,500,000 gallons of oil per year for refining.

**Staffordshire Potteries.**—The dispute between the earthenware manufacturers of the potteries and their workpeople is in a fair way of being settled by arbitration. Business has been generally resumed, excepting in the case of some of the ovenmen, who at first refused to go to arbitration. This led to a meeting of the manufacturers being held, at which, it is said, a lock-out was resolved upon in the event of the ovenmen adhering to their determination. The employers met again on the 23rd ult, and received a deputation of ovenmen from Barslem and Tunstall, who said they were agreeable to a reference. On the evening of the same day the Hanley ovenmen came to a similar decision, and all danger of a conflict seems now to be at an end.

**Harbour Improvements at Shoreham.**—At the first meeting of the new Board of Trustees appointed for the management of Shoreham Harbour, recently held at the Town-hall, Brighton, the trustees, in furtherance of a projected scheme for deepening and improving the harbour, unanimously agreed to hire at once a steam dredger. It was also stated that the arrangements for raising a loan of 100,000*l.* for the purpose of paying off old subscribers and for further works, were in a satisfactory way of settlement. The trustees have initiated an active policy, the carrying out of which will, it is hoped, raise the harbour into a port of importance, and worthy of the neighbouring town of Brighton.

**Compensation Case.**—The case of Coles v. The Metropolitan Board of Works was heard at the Sheriff's Court, Red Lion-square, on the 17th ult., before Mr. Under-Sheriff Barrell and a special jury. Compensation was claimed in respect of leasehold interest in a house in Theobald's-road, required for the formation of the new street extending from New Oxford-street to Shoreditch. The jury went to the *locus in quo*, and had a personal view of the property. On their return a verdict was taken by consent for 225*l.* The claim exceeded 1,000*l.*, including the 10 per cent. for compulsory sale.

**The Military Centre at Bedford.**—Mr. J. Hill has supplied about 400 locks and furniture for this building, the keys of the former all differing throughout. The builders of the Bedford Depot are Messrs. Hill, Higgs, & Hill, of Lambeth, and the works, which are now all but finished, have been carried out under the superintendence of Lieut. Thompson, R.E.

**The Chief Engineership of Newcastle-on-Tyne.**—In reference to the paragraph in last week's *Builder* (p. 1154) we have received a letter stating that it is by no means certain that Mr. McKie is the fortunate candidate, "no appointment having been made." Our paragraph was based upon a statement in one of the Newcastle papers.

**Goldsmiths' Company.**—The Court of this Company have voted 500*l.* in aid of the fund for extending the buildings of the University of Edinburgh. The Company's annual expenditure out of the general corporate funds, quite irrespective of any charity foundation for educational purposes, now amounts to nearly 6,000*l.* a year.—*City Press.*

**The Victoria (Philosophical) Institute** announces a paper on the "Egyptian Myth of Ra" for Monday, when the Institute meets in its new rooms.

### TENDERS

For alterations and repairs at the White Hart, Turner-street, Mile-End, for Messrs. Truman, Hanbury, Buxton, & Co. Mr. W. E. Williams, architect:—  
Palmer ..... 226*l.* 0 0  
May ..... 216 0 0  
Anley ..... 190 0 0

For the erection of a villa at Tring, Herts, for Mr. J. T. Pickburn. Mr. W. P. Griffith, architect. Quantities supplied by Messrs. Arding, Bond, & Buzzard:—  
Brass ..... 25,308 0 0  
Perry & Co. .... 5,163 0 0  
Snell ..... 5,059 0 0  
Hill, Higgs, & Hill ..... 5,048 0 0  
Lawrence & Sons ..... 5,027 0 0  
Pocock ..... 4,770 0 0  
Brown ..... 4,482 0 0  
Fincher ..... 4,492 0 0  
Honour ..... 4,287 10 8

For the construction of new storm-water sewer, for the Hastings Urban Sanitary Authority. Mr. W. Andrews, surveyor. Quantities by Messrs. Cross & Wells:—  
Vidler ..... 23,398 0 0  
Cruttenden ..... 2,352 0 0  
Gasson ..... 2,387 15 0  
Geary ..... 2,273 0 0  
Dowra ..... 2,250 0 0  
Reeve (accepted) ..... 2,092 0 0

For the construction of new sea and parade walls, &c., at West Marina, St. Leonard's-on-Sea, for the Hastings Urban Sanitary Authority. Mr. W. Andrews, surveyor. Quantities by Messrs. Cross & Wells:—  
Geere ..... 217,900 0 0  
Botterill ..... 17,028 0 0  
Marshall ..... 16,700 0 0  
Cruttenden ..... 15,720 0 0  
Parks ..... 15,527 0 0  
Munday ..... 15,439 12 0  
Rorda ..... 15,200 0 0  
Reeve ..... 13,700 0 0  
Geary ..... 12,100 0 0  
King ..... 12,000 0 0  
Jenkins ..... 10,000 0 0

For the construction of seven new groynes at West Marina, St. Leonard's-on-Sea, for the Hastings Urban Sanitary Authority. Mr. W. Andrews, surveyor. Quantities by Messrs. Cross & Wells:—  
Reeve ..... 2,250 0 0  
Marshall ..... 3,300 0 0  
Botterill ..... 2,780 0 0  
Geary ..... 2,760 0 0  
King ..... 2,670 0 0  
Winsor ..... 2,652 0 0

For nine houses on the St. John's Estate, Wakefield. Mr. W. Watson, architect:—  
Fawcett & Co. (accepted) ..... 23,893 0 0

For Board schools at Goole. Mr. W. Watson, architect:—  
Elliott, Calam, & Co. (accepted) ..... 22,694 0 0

For Board school and master's house at Goole. Mr. W. Watson, architect:—  
Jackson & Co. (accepted) ..... 2520 0 0

For altering and refitting the old Market-house, for the Wakefield Borough Market Company. Mr. W. Watson, architect:—  
Fawcett (accepted) ..... 21,509 0 0

For a detached residence at Doncaster. Mr. W. Watson, architect:—  
Anley (accepted) ..... 22,200 0 0

For a detached villa at Manygates Park, Wakefield. Mr. W. Watson, architect:—  
Elvey & Co. (accepted) ..... 21,100 0 0

For a lodge, Manygates Park, Wakefield. Mr. W. Watson, architect:—  
J. & J. Summers & Co. (accepted) ..... 2255 0 0

For alterations at the Skiddaw Tavern, Chippenham-road, Kiburn, for Mr. Clifford. Mr. Cotton, architect:—  
Temple & Forter ..... 2449 0 0  
Lamble ..... 427 0 0  
Toms ..... 382 0 0  
Anley ..... 328 0 0

For alterations and repairs at the Portland Arms Portland-road, Notting-hill, for Mr. Binks. Mr. Cotton, architect:—  
Mills ..... 2649 10 0  
Collins ..... 615 0 0  
Anley ..... 580 0 0

For additions in rear of the Plough Tavern, Hoxton-street, for Mr. Lock. Mr. Hammon, architect:—  
Rawhurst ..... 2734 0 0  
Hodson ..... 685 0 0  
Page ..... 554 0 0  
Anley ..... 540 10 0

For the erection of schools and teacher's residence at Langley, near Macclesfield, for the Sutton School Board. Mr. E. H. Lingen Barker, architect:—  
Grosvenor ..... 23,080 0 0  
Lea & Son ..... 2,062 15 0  
Massey ..... 1,075 0 0  
Cartledge ..... 1,898 18 0  
Webber ..... 1,867 0 0  
Koylance ..... 1,844 0 0  
Smith ..... 1,685 0 0  
Biggs ..... 1,670 0 0  
Ford ..... 1,618 0 0  
Balcombe (accepted) ..... 1,576 0 0

For enlarging the Prudhoe Memorial Convalescent Home at Whitley, Northumberland. Mr. T. Oliver, architect. Quantities by Mr. G. Connell:—  
Elliott ..... 28,312 0 0  
Jackson ..... 6,064 0 0  
Mitcheson ..... 5,971 0 0  
Reed ..... 5,836 0 0  
Millar ..... 5,863 0 0  
Nicholson (too late) ..... 5,662 0 0  
Lee ..... 5,191 0 0  
Robson (too late) ..... 4,913 0 0

For alterations to the Royal Oak, Columbia-road, Bethnal-green, for Mr. B. Hyams. Mr. E. Brown, architect:—  
Marx (accepted) ..... 2240 0 0

For foundations, basement-story, and rainwater-tanks, for Cudham Vicarage. Messrs. Tress & Lanes, architects:—  
Sewell ..... 2903 0 0  
Hawtreay ..... 885 0 0  
Durtnell ..... 899 0 0  
Fish ..... 878 0 0  
Payne & Balding ..... 560 0 0

For alterations and additions to the Prince of Wales's Tavern, East-road, City-road, for Mr. Elston. Mr. John Viney, architect:—  
Staines & Son (accepted) ..... 2340 0 0

For the erection of new premises, Old Bond-street, for Messrs. Thos. Agnew & Sons. Mr. E. Salomons, architect. Quantities by Mr. Bagg:—  
Dove, Bros. .... 232,317 0 0  
Smith & Co. .... 31,620 0 0  
Jackson & Shaw ..... 30,113 0 0  
Trollope & Sons ..... 28,613 0 0  
Holland & Hannen ..... 27,638 0 0

For forming new entrance to the Clerkenwell Mortuary, now being erected in Spa Fields Burial-ground, for the Vestry of St. James and St. John, Clerkenwell. Mr. H. Saxon Snell, architect:—  
Dickens ..... 2388 0 0  
Parker & Evans ..... 330 0 0  
Ebbage ..... 379 0 0  
Sharman ..... 340 0 0

### TO CORRESPONDENTS.

"Who Wants a Church?"—We have received various replies and inquiries, and have forwarded them to the writer of the letter, with whom the matter must now rest.

Bideford Bells (next week).—"Damp" (next week).—"Glass Roofs" (next week).—"Prevention of Echo" (next week).—C. P. H. (it depends on circumstances that should be inquired into. Consult a competent surveyor).—H. N. L. (article has not been received).—R. M. P. (shall appear in due course).—G. C. (we do not propose to return to the subject).—G. T. S.—C. C.—F. P.—E. H. L. R.—J. G.—J. H. T.—W. E.—R. P.—Landowner.—T. W.—A. W. E.—L.—F. B.—S.—F. J.—T. B.—W. C. W. S.—A. B.—H. H.—P. & G.—J. G. H.—Mr. G.—J. W.—J. S.—A Churchwarden.—T. K.—An Old Reader.—J. W.—E. H. H.—T. B.—W. H. L.—J. A.—G. G.—A. J. S.—G. S.—C.—L.—T. M. E. F. C.—M. & S.—L.

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

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# The Builder.

Vol. XXXIV. No. 1766

SATURDAY, DECEMBER 9, 1876.

## ILLUSTRATIONS.

Birmingham Arcade: Zinc Gas Fittings ..... Messrs. Doulton's Premises, High-street, Lambeth: Introducing Terra-Cotta and Stoneware.—Messrs. Tarring, Son, & Wilkinson, Architects

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### Water Supply of Cities and Towns.\*

It has been known for several years that Mr. Humber was preparing for publication a book on waterworks, and now that we have it before us we can congratulate him on having been able to give so large an amount of information on a subject so important as the water supply of cities and towns. In a great work such as this it was necessary to say something of the history of the subject, and accordingly Mr. Humber gives an historical sketch of the ancient methods of procuring water. In ancient Egypt large reservoirs were filled every year by the overflowing of the Nile, but, as a matter of antiquity, the tanks of India are prob-

ably still more remote. In his presidential address to the Institution of Civil Engineers in 1870, the late Mr. Vignoles said that "In the Presidency of Madras there are upwards of 53,000 tanks or reservoirs for irrigation purposes alone, exclusive of small tanks near the villages, all executed by the natives prior to the occupation of the Deccan by the British. The aggregate length of the embankments of these reservoirs is fully 30,000 miles,—that is, more than double the length of all the railways in the United Kingdom; and the bridges, culverts, and sluices are more than 300,000 in number. The stored-up waters sent forth at the proper season still bring to the exchequer of the Madras Presidency a yearly income of a million and a half sterling (one-sixth of the whole revenue), although many of the finest of these reservoirs are in ruins, or useless from want of being properly kept up. One of them, the Ponniy reservoir, in the district of Trichinopoly, has a superficial area of about 80-square miles, say 50,000 acres, and the banks are 30 miles in extent."

Some of the aqueducts constructed by the Romans are referred to by the author, and the old and more recent works for the supply of Paris and London are described.

Of the eight different companies who now supply London with water the first place in any description of the London water supply is usually given to the New River Company. It appears that in addition to the river Lea and springs at

Chadwell, the company at present obtains a large quantity of water from wells on the line of the New River and elsewhere. Their works now consist of steam engines at Hornsey, Hornsey-lane, Highgate, Stoke Newington, and New River Head, of about 1,450 horse-power in the aggregate; covered service reservoirs at Claremont-square, Maiden-lane, Highgate, and Hampstead, of a joint capacity of about 20,000,000 gallons; and main and service pipes of a total length of about 630 miles, varying in diameter from 3 in. to 3 ft. About 340 miles of roads and streets contain New River Company's pipes. The quantity of water distributed in 1870 was 23,160,000 gallons per day to a population of 830,000, living in 114,730 houses.

The Chelsea Water Works Company now take water wholly from the Thames at Seething Wells, where the reservoirs and filter-beds comprise an area of 9 acres. The water is pumped to reservoirs on Putney Heath, through two cast-iron mains. One, 30 in. diameter, conveys filtered water for domestic use, and the other, 15 in. diameter, is for unfiltered water, for road-watering and other purposes. The mains are carried across the Thames at Putney, on an iron aqueduct. The engines are about 1,000-horse power, collectively. The daily supply is about 8½ million gallons, to a population of 200,000, living in 27,000 houses.

The Lambeth Waterworks Company obtain water also from the Thames, at Long Ditton, about three miles above Teddington Lock. The reservoirs comprise an area of about 4½ acres,—by the bye, the author does not seem to have taken account of a new and large reservoir which this company have recently made higher up the river, opposite to Hampton, or thereabouts,—and the water is pumped through cast-iron mains, 30 in. diameter, to Brixton, a distance of 10½ miles, by engines of a nominal power of 970-horse power. At Brixton water is pumped further, to Streatham, Selhurst, and Rook Hill, by five engines, of 330-horse power. The Kingston district is supplied by a separate main, delivering water into a reservoir on Kingston-hill. The average daily supply is 10½ million gallons, to a population of 290,000, living in 45,000 houses.

The Grand Junction Company have their works at Hampton, where the water is admitted from the Thames into two subsiding reservoirs, of a joint area of about 2 acres. Two engines, each of 110-horse power, pump water through a 33-in. main, to Kew Bridge, a distance of 7½ miles. At Kew there are three subsiding reservoirs, together about 9 acres, and holding 28 million gallons. There are also three filter-beds, with a joint area of 5½ acres. The engines at Kew are of about 1,270-horse power in the aggregate, and pump water through a 30-in. main into covered reservoirs at Campden-hill, Kensington, which contain 18 million gallons. Here are also three engines, of 200-horse power, for the supply of the higher portion of Paddington. The average daily supply is 10½ million gallons, to a population of 288,000, living in

32,000 houses (estimated for the year 1870). The total length of this company's mains is upwards of 220 miles.

The West Middlesex Company have their works also at Hampton. Here are two engines, 105-horse power each, which pump the water through two 36-in. mains to reservoirs at Barnes, a distance of 8½ miles. The subsiding reservoirs at Barnes have an area of 20½ acres, and adjoining them are five filter-beds, with an area of 8 acres. From these the water is conveyed in two 36-in. mains to Hammersmith, whence it is pumped into the district. The service-reservoirs are at Campden hill and Barrow-hill. Part of the water is further pumped by 90-horse power engines into the Kidderpore reservoirs, near Child's-hill, containing 2½ million gallons. The daily supply averages about 9 million gallons, to 321,000 inhabitants, living in 43,000 houses.

The Southwark and Vauxhall Waterworks Company also take water from the Thames at Hampton, into depositing reservoirs of about two acres in extent. Three engines, of 390 horse-power collectively, pump the water through a 36-in. main to the reservoirs at Battersea,—a distance of thirteen miles. The Battersea reservoirs have an area of about 12 acres, and hold 46 million gallons. Here are two filter beds, with a joint area of 8½ acres. The company have six engines at work, of 1,200 horse-power collectively. At Hampton, there are a subsiding reservoir of 3½ acres, three filter-beds of 3 acres, and two engines of 450 horse-power together. A 30-in. main, ten miles long, conveys the water to London. This company have about 660 miles of mains and service-pipes in about 360 miles of streets and roads. The daily supply is about 15 million gallons to a population of 480,000, living in 76,700 houses.

The East London Waterworks Company have a series of reservoirs or lakes on the Walthamstow side of the river Lea, which have a water area of 250 acres, and a capacity of 700 million gallons, of which 400 millions can be drawn off by opening the sluices, the space below the sluice level receiving the solid matter deposited by subsidence. These reservoirs render the company independent of the river for a month at a time. From these settling-reservoirs the water passes to the filter-beds at Lea Bridge, nineteen in number, with a sand area of 18 acres, whence it is conveyed by a brick culvert, 6 ft. by 3 ft. 6 in. to the engine-wells of the northern, or Lea Bridge, pumping station, and by an iron main, 4 ft. in diameter, to the southern, or Old Ford, pumping station. At Lea Bridge, there are three engine-houses, containing 630 horse-power. At Old Ford there are five engine-houses, containing 620 horse-power. The author remarks, and we are glad of the opportunity to repeat, that the Cornish engine was here first applied to the pumping of water for the supply of towns, by Mr. Wicksteed. Most engineers prefer the rotatory engine for pumping through mains, but nevertheless great credit is due to the memory of the late Mr. Wicksteed for what he did at Old Ford.

\* Water Supply of Cities and Towns. By William Humber, Assoc. Inst. C.E., Mem. Inst. M.E. London: Crosby Lockwood & Co. 1876.



At Lea Bridge, it is said, water power is usually employed in addition to the steam engines above referred to, and at Walthamstow there are auxiliary engines (steam and water) of 60 actual horse-power. The average daily supply in 1871 is stated to have been 20,437,000 gallons to a population of 750,000 living in 102,624 houses. The length of streets supplied is estimated at 350 miles. The East London Company have since constructed large works at Sunbury, for taking water from the Thames, above the intakes of the companies already named, by which the company are empowered to take a supply of 10 million gallons per day.

The Kent Waterworks Company obtain most of their water from three wells in the chalk at Deptford, each of which has a separate pumping-engine. Other engines pump the water for distribution. There are also two wells at Charlton, one at Plumstead, one at Crayford, and two at Bromley. The company have 18 engines, together working on an average up to about 1,200 horse-power. The service-reservoirs are at Greenwich Park, Woolwich Common, Plumstead, and Chislehurst, holding in all about 4,500,000 gallons. The average daily supply is over 7,000,000 gallons, to a population of nearly 360,000, living in 40,000 houses.

Now, if these several works for the supply of London with water be regarded, it will be seen that they embrace all the three systems of water supply, viz., by gravitation, as in the New River works; by pumping from rivers, as the Thames and Lea; and by pumping from wells, as in the Kent works.

The quality of the water from these several sources varies considerably, as is shown by the author; but we will not dwell upon this point, further than to quote that "It is asserted that water contaminated with sewage contains that which is noxious to human health, and that there is no process practicable on a large scale by which it can be removed to render the water suitable for domestic use." The author treats fully of the chemical qualities of these various waters, but perhaps the best guides we have on this point are the periodical reports of the water examiner, published in current journals. Rain-fall and evaporation are next treated of, and the propriety is recognised of the now well-known practice of taking for calculation not the mean annual rainfall of any locality, but five-sixths of it, as being the approximate quantity which falls in any three consecutive dry years, and from the records of rainfall at the Greenwich Observatory, three consecutive dry years appear to occur at intervals of about twenty-two years. The greatest fall in twenty-four hours is an element of much importance, and the following rule is given as being conformable with observations:—"With a mean fall of 20 in. it is 16 per cent. of the mean annual fall (i.e., 3.20 in.); for each increase of 4 in. in the mean annual fall it decreases one per cent., until the latter reaches 60 in.; beyond that point it remains stationary at six per cent, however great the annual fall may be." An important chapter on springs and the water-bearing formations of various districts follows, in which are recounted the remarks of Professors Prestwich and Hull, and numerous observations of Mr. Dickenson, Mr. Charnock, Dr. Dalton, and others, both at home and abroad. In a chapter on the "Measurement and Estimation of the Flow of Water," the formulae deduced from the experiments of many observers are given from some of the well-known authorities on hydraulics, including the experiments of Mr. Blackwell on the flow of water over weirs, made on the Kennett and Avon Canal, and by M. Boileau and MM. Poncelet and Lesbros at Metz.

As to the quantity of water required for a town-supply, the author says the average quantity actually consumed per head of the population, varies from about 15 gallons per day to more than 50 gallons—the former example being that of Norwich, and the latter that of Glasgow. These quantities include water for domestic purposes, trade purposes, street watering, flushing sewers, and extinction of fires; but in taking the domestic consumption separately at 10 gallons, derived from experiments made by placing meters on pipes supplying known numbers of houses and inhabitants, as has been frequently done when it has been desired to ascertain how small a quantity of water people use, the author makes, as it appears to us, the same mistake as others have done on this subject, or rather, perhaps, we ought to say, leaves the same wrong inference to be drawn from the statements of quantities

thus measured. In all works, large and small, and now as well as old, there is a large quantity of water, necessary to be supplied, which is not used. This may be called waste, but as it is unavoidable, it must be included in the total supply, and a fair proportion of it should be added to the quantity shown by the meter under the circumstances described, in the same ratio that the number of those inhabitants bears to the whole population. Besides, the meagre quantity now used for baths may be reasonably expected to be largely increased within no very long time; not, perhaps, for such baths as we have now, where the purchase of the ground costs so much that an insufficient sum is left for what is wanted, but for baths on a different system, and of more general use. There is another point worthy of being mentioned when the example of Norwich is adduced as a guide to the quantity of water required; it is stated by the author, and is that in that city not more than one-fourth of the inhabitants have access to water-closets. It is not necessary to raise the question whether water-closets are advisable or not in any town, but the fact above stated should be borne in mind when the comparatively small quantity of 14 or 15 gallons per head per day supplied to the population of Norwich is adduced. In gravitation works the method adopted to ascertain the available quantity of water from any given area is fairly stated by the author, but on this point he might have easily given some examples from executed works which would have been useful to waterworks' engineers. The next kind of works referred to is that in which the water is pumped from a river or stream, and two methods of ascertaining the mean velocity of a stream are stated, one by observations of the surface velocity, and the other by instruments immersed in it. The chapter on wells and well-sinking is particularly good, and in the one which follows it, on reservoir embankments, it is very properly stated that the usual inclination given to the outer slope is 2 to 1, and to the inner slope 3 to 1, and that the reason why the inner slope should be greater than the outer is that the angle of stability of the material is somewhat reduced by the presence of water.

An apparatus for "automatically regulating the height of the water in filter-beds" is described and illustrated by a diagram. Why might it not have been stated where this apparatus is in use? We know of but one place, although its applicability is common to many works.

The purification of water forms another chapter and sections of the London filter-beds are given, showing the thicknesses of the filtering materials.

Pumps and pumping machinery follow, including valves and their action, and some examples of boilers are given, and then follows a chapter on conduits, with the cross sections of the conduits designed by Mr. Bateman and by Messrs. Hemans and Hassard for supplying London with water from the Welsh hills and from the Cumberland lakes respectively.

Under the head of "Distribution of Water," the thicknesses of cast-iron pipes are treated of, and a very useful instrument for measuring the thickness of the body of a pipe is illustrated.

In taking 15,000 lb. as the cohesive strength of cast-iron pipes per square inch of section of metal, however, we think the author has over-estimated the strength, at least of large mains. The apparatus of distribution includes hydrants, meters, lead service-pipes, and lead-encased tin pipes, ferrules, house fittings, &c.

Coming to the economy of waterworks, tables are given of the cost of gravitation works, the average of sixty-six towns being about 32s. for twenty gallons per day, and of pumping works about 23s. 3d.; but although gravitation works are more expensive in their first cost, the annual expenses are much greater, for pumping and wear and tear of machinery. An extensive table of rates and charges is added.

Perhaps one of the most interesting chapters of the book,—and especially just at this time,—is that on the Canterbury Waterworks, describing the practical application of Dr. Clark's process for removing the excess of carbonate of lime from the hard chalk waters.

Specifications of various parts of several executed works are given in an appendix.

The plates, fifty in number, are mostly drawings of executed works, and alone would have commanded the attention of every engineer whose practice may lie in this branch of the profession. The book is inscribed to Mr. Rawlinson, C.B., M. Inst. C.E.

#### THE WITNESS OF ART.

"Who shall read these pages? Men, perhaps, with grave eyes, who will detect faults in every line, and yet, seeing that I am in earnest, will not cast them hastily aside." In these words the author of the book published under the above title\* has perhaps very nearly hit the truth as to the feeling with which thoughtful readers will regard his meditations upon art. His writing is very deficient in clearness of form and style; it is very redundant: indeed, the author openly avows that he can see no objection to repeating a whole paragraph which has before been used in another place, when the particular point it deals with is to be again enforced,—a kind of literary method which is clumsy, absurd, and objectionable in the highest degree. His method of treating his subject borders on what may be termed the mystical, and his perpetual dealing in tropes and figures gives further vagueness to a style which is by no means very connected or logical. Against all this is to be set the fact that the author is in earnest, and really cares for his subject, and that his conclusions are nearly all good and true, however oddly he seems to arrive at them. And perhaps Mr. Baylis has a further claim to sympathetic reception at our hands, inasmuch as he is known on the walls of our exhibitions as an artist specially devoted to architectural subjects, whose fine and richly-coloured interior views of great buildings, cathedrals especially, may count among the means by which architectural beauty is brought home to the minds of the people.

The main object of Mr. Baylis's pages is to lead their readers to a feeling of the sacred and ennobling mission of Art, as "not a plaything, but an influence upon our lives, real and distinct; and to show that this influence is altogether for our good." This has been said, no doubt, often enough in one way or another; not often, however, in the tone of serious, almost religious, gravity with which the author invests his subject. Borrowing a metaphor which has been used in allegory of a more distinctly religious character, he calls art "The King's Messenger," a simile the import of which is obvious enough; but we fear Mr. Baylis's first two chapters, in which the idea thus implied is blended with another simile taken from the time-honoured fairy tale of "Beauty and the Beast," will be found too involved for its meaning to reach juvenile minds, and too (we fear we must say) childish in tone to be very satisfactory reading to maturer minds. This is a pity; because, though this is not the best part of the book, there is a really important thought included in it, as to the contrast between art and mere symbolism, a subject which is returned to several times in the course of the book, and on which the author's idea is as clear as possible, and expressed occasionally in a forcible and piquant manner. Symbolism he regards as the forerunner of art. A little child is found embracing with the greatest affection a hideous and disfigured black doll. A primitive rustic people bow before an almost equally hideous image, which to them represents the Mother of Christ; or, to look further back, through a long vista of centuries,—

"We see a people sunk in black darkness like that which still reigns where the sweet light of Christianity is unknown. We see them, with outstretched arms in the darkness, as if trying to touch but the hem of His garment who sitteth upon the throne. First make your gods; this they proceed to do. Two pillars of stone, placed side by side, stand very well for Castor and Pollux, and a bar or slab laid across from one to the other suffices to express their mutual affection."

First make your gods. "Ah! not so," says the author, "that is the finishing stroke." To make something, anything, as a symbol and then attribute beauty and sanctity to it, is an operation satisfying to the childish or (which is in a sense the same thing) the barbarian mind only. But art must be the embodiment of a beauty before conceived in the mind, not an arbitrarily chosen symbol. This seems a truism when we look at the question in relation to such primitive symbolism as in the instances referred to, but there have been and are phases in the practice of art which show what confusion often reigns, in the minds of those who have once dabbled with symbolism, between the idea and the means of expressing it in art. This subject is well touched upon in the last section of Mr. Baylis's book, on "The Supernatural in Art," which is an amplification of a paper read under this title at a meeting of the Architectural Association not very long since, great part of which was

\* "The Witness of Art, or the Legend of Beauty." By Wyke Baylis, F.S.A., Vice-president of the Society of British Artists. London: Hodder & Stoughton.



printed in our columns. In this portion of the book, which constitutes a separate essay in six chapters, a difficult and very interesting subject is treated with considerable critical insight and some novelty of illustration, and the author's sometimes rather rhapsodical style is not out of keeping with the subject. Mr. Bayliss contrasts the reticence of Classic art in treating of the Supernatural with the opposite character of Mediæval art,—

"where this unknown quantity, which cannot be legitimately expressed, is by any means and every means attempted to be implied. The nimbus round the head, varying in colour and design, according to the dignity of the sacred character. The wings of the angels, which must be anatomically false; and, above all, the curious expedient of representing the saints as of a larger size than the other figures of the group. . . . Of such expedients we may at least affirm that they do not tend to the elevation of art. Perhaps it is as true of the artist as it is of the philosopher and the divine, that he cannot predicate too little of the unknown."

For, consider to what such symbolism will lead. If beauty of form and truth of drawing are to be abandoned for a supposed sacred purpose, it will inevitably follow that the deviation from truth and beauty will be required first of all in the very figures which are to be especially revered. The accessories will be allowed to retain their normal conditions, there is nothing supernatural about them. But will the accessories consent to retain their normal condition? Ah! not so. The knowledge of what is beautiful and the power of drawing truthfully from nature are not to be attained by the half-hearted labour given to accessories. The painter who begins by dethroning Beauty and Truth need not be surprised if they refuse to wait upon him as his servants. At first relegated to the background, they will presently slip out of his canvas altogether, and the painter will find himself alone, with nothing but his own intentions to stare him in the face. In other words, the law of art will become, that all things should be ugly,—and the more ugly the more divine."

This is a clear and uncompromising statement of a fallacy especially illustrated in what is called religious art; and though it never at the present day sinks to such a complete *reductio ad absurdum* as is implied in the closing lines of the above quotation, the wrong principle alluded to has been only too much illustrated in much of our ecclesiastical decorative art, which only escapes the extreme consequences by stopping half way. Much of the further illustration of the subject by the author, especially in his examples drawn from the supernatural element in "Paradise Lost" and its possibilities in regard to representation in art, is very good, and well worth reading; the whole tendency of the argument being to show that art can only successfully speak to us through the medium of the material beauties which we are conscious of through our ordinary senses; and it is gratifying to find this healthy view of the supernatural in art so strongly put forward by a writer whose general tone of mind, inclining, we may say, towards the mystical, is what we are more accustomed to find associated with the false view of art which he opposes here. In some of his illustrations he is less happy, as in bringing examples from the "Ingoldby Legends" to illustrate the false use of the supernatural, which is giving a great deal too much importance to a vulgar *jeu d'esprit*; and Mr. Bayliss ought not to have taken the whole story of the "Christ of Andernach," word for word, from the pages of Longfellow's "Hyperion" without acknowledgment.

But what pleases us most in the book is Mr. Bayliss's critical discrimination of what he classes as the three great typical periods in art, so far; Greek art, Renaissance painting, and modern landscape painting. The limits of Greek art he very well defines; and this is a useful definition, as among those who appreciate fully the transcendent power of the Greek artist within his own limits there is often a tendency to regard his productions as fulfilling every need of art. This, however, has perhaps never been done yet by any artist or any school, taken alone. As the author says, we must "revere intelligently. If Polykletos was greater than Michelangelo in ideality, Michelangelo was greater than Polykletos in fervour; but this implies that an excellence is conceivable that should surpass both." Carrying the consideration of Greek art a little further, we may all admit that "if the realisation of strength, grace, and beauty is the one aim of art, there is an end of the matter," Greek art has achieved perfection, and we are only called upon to be its disciples.

"But if art has no such limits, then the schools of Greece and Rome are weak as well as strong. The intellectuality of Apollo finds expression through the splendour of physical development, but there is no place in the studio for Aristotle's poor deformed face. Yet surely there must have been times, when a fire flashed from his eyes as worthy of the artist's labour to immortalise as were the muscles of the wrestler. But what was the expression either of character or of passion to the Greeks, who awarded Socrates with a draught of hemlock, and Phryne with a niche in the temples of the gods?"

This is admirably put. We are not so sure of

the correctness of Mr. Bayliss's judgment in regard to the Laocœon, and the question which has been so often debated, in reference to that work, as to the fitness of representing in art, and in sculpture especially, the realistic expression of bodily pain. Mr. Bayliss holds that the Laocœon does express this, and expresses it intensely, and that it has thus proved that such expression is within the domain of high art. But while we agree with him that the expression of pain in the Laocœon is much more intense and real than many critics have considered it, we deny that it is realistic; and if it were, we believe the statue would be found nearly intolerable. In the last Academy exhibition there was a clever figure of the Spartan boy suffering from the bite of the fox hidden under his cloak, which in a certain way was successful; but here the aim was to represent the forcible control of, not the indulgence in, the expression of pain; and, even so, the figure was one we certainly should not wish to see before us continually.

The true strength of the Renaissance painting lay, as Mr. Bayliss observes, in its passionate expression; but this was essentially the art of painters, not of sculptors. The "heresy of infidelity," of want of love for and faith in human nature, made the weakness of Classic art; the "heresy of superstition," the effort at something vaguely supposed to be above human nature, made the weakness of the Renaissance. Then with the Reformation epoch came also the iconoclastic movement, breaking up the art which had been identified with superstition; as the author says, plunging up the ground, roughly enough, for the next growth of art. The world of Nature had been neglected by both Greek and Mediæval artist. "Claude, indeed, and Poussin, had ventured into the good land; but at best we may liken them to the spies of old, who brought back a doubtful report; and the venerable Titian seems to have stood, like the great leader on Pisgah, seeing, but not permitted to enter." In the Greek landscape "we have the cloud-compelling god, but nothing of the cirrus or cumulus that fills the sky. Instead of the sunrise we see Aurora; instead of the fields we see Pan." This is very nearly true; not quite, perhaps, for Mr. Bayliss seems to forget the "hoary sea" and "shadowy mountains" of Homer.

"And yet Virgil was a landscape poet, and Claude was a landscape painter; but neither of them knew the full glory of Landscape Art. They trusted to a Cyclops, or a nymph, or a goddess in the clouds, to help them in a difficulty, when they should have listened only to the whispering of the leaves, and seen only the tremor that runs through the cornfield when the sun rushes up from behind the purple mountains. . . ."

Hitherto men had worked in schools and systems; the theories of Art were transmitted from master to disciple. Thus the Caracci followed Correggio, and Guido followed the Caracci. It was a new thing when Paul Potter took his canvas out into the fields, and, as the cattle munched the clover, or gazed dreamily into his face, painted meadow and cattle simply as he saw them, without reference to how they should be painted according to the schools."

This, which at first sight might seem but the material aspect of landscape-painting, was the necessary training it had to go through before reaching its deeper and more spiritual development. And what is the one point in which Landscape Art, more than in any other, differs in its appeal to us from the schools of art that have preceded it? The manner in which this question is answered is the best point of criticism in Mr. Bayliss's paper. It consists in the manner which, in contemplating this class of art-productions, we are compelled to bring our own feelings to meet those of the artist,—to make ourselves a part of what we see. In the representations of the deeds and passions of human beings we are outside the picture; we contemplate them as personages with whom we may or not sympathise, whom we may hate or admire. But in looking at a landscape "the passions awakened are within us: they are our own; we are not witnesses, but actors." This view of the subject is illustrated at some length, and not inaptly; but the simple statement of the case must be recognised as true by all who have an innate feeling for landscape art. It is this which makes modern landscape appeal so strongly to the interest and sympathies of this generation of men, responding as it does to that vague and indefinite emotion so characteristic of modern feeling, and of which modern music is, in another way, an expression.

We have touched upon the main conclusions led to in Mr. Wyke Bayliss's book, seeing that they are not only true, but such as are to some

\* "Mediæval" seems to be used by Mr. Bayliss in a more extended sense than usual, as including all art between the Classic and the modern period.

extent overlooked at present. It is not often that the mean is hit, in art or art-criticism, between love of mere realism on the one hand, and too unreal and vague aims at what is beyond the reach of art; though certainly, on the whole, realism, in England especially, may be said to be rather predominant at present. The specialty of Mr. Bayliss's view of his subject is that he inculcates realism as the true means in art without mistaking it for the end, and that he brings to his task an enthusiasm and earnestness of feeling, a conviction of the serious and beneficent purport of art, which is too rare a characteristic at present, when art is looked upon by so many as merely a means of decoration. His method of illustrating and setting forth his subject contains a good deal that is pleasant to read, and picturesque, with the literary defects we have already mentioned, and with what we might be tempted to call an affectation of highly-wrought imagery and sentiment, did we not see reason to think that in this case there is none of that intentional effort at fine language which constitutes the vice of literary affectation. Still, when the author reminds us that art is not for the artist, but for all,—that Raffaele alone has aided the intellectual education of millions,—we cannot but remember that great part of the force and value both of art and of criticism, with the masses especially, lies in simplicity and directness of purpose. A good deal of what Mr. Bayliss has said would have been more effective to the majority of readers, and more pleasing to the minority, if clothed in a simpler and less fanciful literary garb. The main end of his reflections is very well and much more simply expressed in a few lines of Emerson's on "Art," which, as they are hardly popularly known, we may quote as a finish to our remarks:—

"Give to barrows, trays, and pans  
Grace and glimmer of romance;  
Bring the moonlight into noon,  
Bid in gleaming piles of stone;  
On the city's paved street  
Plant gardens lined with lilacs sweet;  
Let spouting fountains cool the air,  
Singing in the sun-baked square;  
Let statue, picture, park, and hall,  
Ballad, flag, and festival,  
The past restore, the day adorn,  
And make the morrow a new morn.  
So shall the drudge in dusty frock  
Spy behind the city clock  
Reliques of airy kings,  
Skirts of angels, starry wings,  
His father's shining in bright fables,  
His children fed at heavenly tables;  
'Tis the privilege of Art  
Thus to play its cheerful part,  
Man on earth to acclimate  
And bend the exile to his fate."

#### THE INAUGURATION OF THE NEW MANUFACTORY AT SÈVRES.

On Friday, the 17th ult., the new buildings of the manufacture of Sèvres were formally inaugurated under the presidency of M. le Maréchal MacMahon. The ceremony was one of great interest to the Parisian world of art and science, and afforded the Marshal President one of the first opportunities he has had since his tenure of office of associating himself with the artistic and royal traditions of the past.

The manufacture of Sèvres porcelain is not by any means so old as many other ceramic industries in Europe; it only carries us back to the end of the seventeenth century. Just at about the same period in England the Chelsea works were set up, one Morin, a chemist from Toulon, established himself at Saint Cloud, near Paris, with Chicanneau as his manager. An interesting record of this manufactory is left us in the mention of it by Martin Lister, an Englishman, who, in the train of Lord Portland's Embassy to Paris, in 1698, described his journey.\*

"I saw the *Pâtisserie de St. Clou*, with which I was marvellously well pleased, for I confess I could not distinguish betwixt the pots made there and the finest *China ware* I ever saw. It will, I know, be easily granted me that the *paintings* may be better designed and finished (as indeed it was), because our men are far better masters in that art than the *Chinoises* (sic); but the glazing came not in the least behind theirs, not for whiteness nor the smoothness of running without bubbles; again, the *inward substance* and matter of the pots was to me the very same, hard and firm as marble, and the self-same grain, on this side *vitification*. Farther, the transparency of the pots the very same."†

\* Martin Lister is one of the few travellers of the seventeenth century, the only Englishman, who have left us any account of their travels in France.

† See Martin Lister's *Journey to Paris in the year 1698*, p. 138, Ed. of 1699.



The manufactory was much patronised by the great, and the *Mercure Galant* does not forget to mention the visits made by royalty, ambassadors, distinguished foreigners, and others to the establishment at Saint Cloud; and we can easily imagine the interest with which the dainty *marquise* and the still daintier *marquise* of that elegant period must have watched the progress of the work they had given orders to be executed to decorate their gilded salons.

According to Alexandre Brongniart,\* the manufactory at Chantilly was founded about 1735, and the authors of the first productions were workmen from Saint Cloud, by name Dubois, brothers. But official documents carry us back to 1720, the attempts of Ciquaire Ciron, the true founder of the establishment, and prove that in 1735 the works were in full activity, and satisfied already several foreign demands. That the Dubois, "those nomads of pottery," quitted Saint Cloud and passed by Chantilly before going to Vincennes, cannot be denied. Only the incapacity which they showed in their personal enterprise suffices to prove how useless they must have been to Ciron, or to Louis-Henri, Prince de Condé, protector of the manufactory. By the letters patent granted to Ciron under date October 5th, 1735, and registered in the following year, his plan is evident: it was to imitate the finest quality of Japanese porcelain, classed by collectors under the name of the "archaic family," the first that was introduced into Europe. Without doubt the Prince de Condé, a great amateur and possessor of a fine collection of Oriental vases, directed him in this way.

The constant perfection of the porcelains of Chantilly would never allow one to guess how many vicissitudes the factory went through. It, however, several times changed masters. To Ciron succeeded Antheaume, Potter, Baynal, and Lallement, who, after having seen the factory sink in his hands under the blow of political events, did not hesitate to re-enter as a simple potter in another establishment. There is nothing which this factory did not produce, from the most costly vases down to the most ordinary services of china.

The Brothers Dubois, not having been able to maintain themselves at St. Cloud, nor divide the success of their comrade Ciron at Chantilly, were obliged to seek elsewhere their fortune. In 1740 they proposed to M. Orry de Fulvy, *intendant des finances*, and brother of M. Orry, Louis XV.'s Minister, to make known to him the secret of the manufacture of porcelain.

For some time past a desire had been expressed in high quarters to erect an establishment which should rival that in Saxony. The Dubois were consequently welcomed with open arms, and the Minister gave them a laboratory at Vincennes, and M. Orry de Fulvy was charged with providing the necessary funds. The incapacity, however, of the brothers was soon discovered, and, after several acts of misconduct, they were at length dismissed, after three years of useless work, which had cost no less than 60,000 francs. One of their assistants, however, Gravant by name, an intelligent and active man, had followed with interest the attempts of his patrons, and, continuing his researches, succeeded in obtaining a tender porcelain, the secret of which he confided to M. Orry de Fulvy. Again aided by his brother, this gentleman formed, in 1745, a company, whose seat was to remain in the historical fortress of Vincennes.† The following year the celebrated chemist Hellot was attached to the factory, and contributed powerfully to its progress.

Legrand d'Aussy tells us that from the creation of the royal manufactory public criticism was invoked. "The first important work which the manufacture (of Vincennes) produced was a service for the king, in 1754. It was exposed in Paris for public admiration." From this date till 1790 the chief works of the royal manufactory were annually exhibited in the *salon* of the *Éil de Bœuf*, at the Louvre, from Christmas-day to Twelfth-day. Presents and New Year's gifts were made by the king to the crowned heads of Europe, and as rewards to Ministers and others.‡ In the accounts of the manufactory may be found, in addition to the mention of numerous presents to foreign ambassadors, a list of the pieces composing the service

to be presented to the Directory, the price of which, in *assignats*, is fixed at 2,304,240 francs, and in coined money at 38,404 francs. In 1815 the system of private exhibition at the Louvre was again introduced, and continued till 1848; and in 1832, under Louis Philippe, the public were freely admitted.

Before long numerous spurious pieces of china flooded the market, and great complaints were uttered by the administrator, M. Charles Adam; but the Court, believing them to be exaggerated, at last, in 1753, transferred the power to Eloy Brichard; the decree further stating "the pieces of porcelain of the said manufactory shall be marked with a double L interwined in form of a cipher, which shall be the distinctive mark of works coming thence." This important innovation furnishes a precise date for the vases signed with the two Ls with numeral letters.\*

In effect, from the year 1753 Louis XV. took upon himself a third of the expenses of the Vincennes establishment, which from this time takes the official title of the "Manufacture Royale de Porcelaine de France," and the mark becomes obligatory. Thanks to the skill of the administrator, who, by means of law and heavy fines, succeeded in stopping the fabrication of false porcelain, the factory arrived at considerable prosperity, and a renown without equal.

In 1754, the Empress of Russia commanded the famous service, ornamented with imitations of antique cameos, the enormous price of which was to raise, later on, a serious correspondence between the statesmen of the two countries. From the archives of the manufactory of Sèvres we are able to describe how, in a long memorandum prepared with care, the Minister Birtin explains to the empress how 360,000 livres is no exaggerated sum to pay for a unique *chef d'œuvre*, at which all the ceramic artists of the period were obliged to work. The number of commands, however, continued, and brought about necessarily a need of an increase of hands on the establishment; the *matériel* no more supplied the daily needs, and the manufactory found itself restricted for want of room in the old fortress; in addition to which, the company determined to lodge at the factory, and purchased therefore with this view a house and property at Sèvres which had belonged to Lully, the famous musician. Here an immense building was erected, which, notwithstanding its numberless annexes, did not suffice for the wants of the late imperial manufactory. Little was that dreamt of in the middle of the eighteenth century when, in 1756, the royal manufactory established itself at Sèvres.†

Whatever may have been the reputation of the Vincennes establishment, it rapidly gave way to the new factory at Sèvres, or Sève, according to the orthography of the time (Boswell in his "Life of Johnson" spells it thus, in giving the journal of the "great man's" visit to Paris in 1775‡), and the name expressed the perfection of tender porcelain, as much as Dresden the supreme degree of European hard porcelain.

Difficulties soon rose, however, from the immense number of imitations with which the market was supplied, and Eloy Brichard declared, just as his predecessor had done, his powerlessness to stop this: notwithstanding, it was ruining him, as the cheapness of these falsifications injured seriously his prices. At last matters reached such a pitch that the king took the matter in hand, and resolved to arrogate the supreme authority, and a decree of the 17th of February, 1760, declared that from the 15th of October, 1759, this privilege accorded to the company (whose term was fixed at the end of the year 1764) should be withdrawn. This decree ordered that the manufactory should, for the future, be administered for the king.

In addition, in order in every way to aid the new administration, vigorous measures were immediately adopted. By order of the celebrated lieutenant-general of police, De Sartines, all persons were strictly forbidden, under heavy penalties, in any way to produce any imitations. In all pottery work the use of gold was strictly reprobated. So harsh were the articles of this decree, that complaints were made by numerous manufacturers, and a new decree was passed in 1766, allowing more liberty of action. Establishments were now springing up in large numbers; but an important discovery was soon to work a great change in the manufacture, that of

kaolin in France. In 1753, a citizen of Strasbourg, Paul Hannong by name, had offered to M. Boileau, director of the Vincennes establishment, the secret of the compositions of Germany. His price was, however, so exorbitant, that the offer was refused, it being doubted, also, whether Hannong had not procured his materials on French soil. Forbidden, in addition, to introduce his pottery into France, he offered his services to the Elector Palatine, and founded the manufacture of Frankenthal. In 1765 Guettard read before the Academy of Sciences a paper, stating the existence in France of clay suitable for the making of hard porcelain. This was denied by the Comte de Lauraguais; but from geological proofs it became evident that the spot near Alençon yielded the necessary material. At last a happy circumstance settled for ever the difficulties of the discussion. Madame Darnet, wife of a surgeon, near Limoges, remarked in a ravine near that town a white, unctuous earth, which seemed to her suitable to replace soap in washing her linen. Making known her idea to her husband, he communicated it to an apothecary at Bordeaux, who, in his turn, having procured a sufficient quantity of the earth for experimental purposes, carried it to the chemist Macquer, whose studies were specially leaning in that direction. From this time it became evident that France might rival Germany and the East in their productions in hard porcelain. This had occurred in 1768, and after five years of experiment and trial the royal manufactory at Sèvres was able to produce the two kinds of translucent pottery.\* In 1773 M. Boileau was succeeded in the directorship by M. Parent, a man of large views, but with order in his operations or in the management of the accounts. In 1778 he was arrested, and M. Regnier succeeded him next year. This epoch may be considered as that of the greatest development of the royal manufactory.

The discovery of kaolin, in France, gave an immense field to private enterprise; indeed, so great was the number of factories, especially round Paris, that at one moment the quantity of fuel they used threatened the capital with a want of wood. The market in addition became filled with every kind of porcelain decoration, and at last a decree of 1784 restricted the making of certain ornaments, such as the royal manufactory produced, allowing alone the fabrication of ordinary useful china. The mark of the maker was more than ever obligatory, and all imitation of the two Ls was heavily fined. At this period also commenced, in consequence of the restriction of wood made on the fabricants, the use of coal in lieu of wood for the purpose of baking the porcelain. But the large number of factories above spoken of was now becoming worthy of consideration, and a decree was at last passed in 1787, with a view to obliging all manufactories to pass a competition before being allowed to produce for the public.

But a great storm was now bursting over France, and the awful scenes of the Revolution were visible on the horizon; blacker and blacker grew the clouds, till at last they broke over the country and crushed it. It is extraordinary, however, that at such a period of general levelling the manufacture of Sèvres should remain; remain, however, it did.† Notwithstanding the numerous jealousies that such a favoured establishment must have roused, no harm came to it. It was generally seen, that by continuing the Government support to the factory, advance might be made, while, if it were left to the care of private individuals the expense of trials, and the consequent loss in case of failure, could not do otherwise than retard any chance of progress. The emulation engendered also by the success of the parent establishment was considered as certain to have wholesome effects on private ventures. Under the Directory the manufacture of Sèvres was administered by a triumvirate composed of MM. Salmon, Ettlinger, and Meyer. In 1800 M. Brongniart took the whole direction, and preserved it till the epoch of his death in 1847. M. Ebelmen succeeded him,—his early death in 1852 was much lamented. His successor was M. Regnault, a member of the Institute.

The history of porcelain manufacture in France having thus been treated of, another task remains,—a difficult one, indeed,—in the words of M. Jacquemart, the learned compiler of the history of porcelain,—it is "to appreciate the artistic merits of pottery vicious in its elements, and of

\* Director of the Sèvres manufactory at the beginning of this century.

† Situated just outside the eastern gates of Paris and surrounded by a beautiful wood.

‡ Probably the last service of Sèvres from the royal manufactory presented to an Englishman was that given to John Martin, the painter, by Charles X.

\* The letter A indicates the year 1753, from which time the alphabet continued. I and J are two different letters.

† A portion of the old house of Lully still exists, and serves as a water-tower.

‡ "October 26 (1775), Thursday.—We saw the china at Sèvres, glazed, and painted."

\* Till 1812 the two kinds were made, but after that year the manufacture of all objects in tender porcelain ceased.

† Along with the State Factory of the Gobelins.



which, in spite of the technical superiority of certain contemporary works, in spite of the successive discoveries of science, the ancient specimens remain quoted at the highest price among the curiosities with which fortune and taste surround themselves."

After the violent commotions of the end of the eighteenth century, after the successive devastations that all the royal châteaux and the public monuments underwent in France, the finest works of Sèvres manufacture disappeared. At least, if it were impossible to form a museum of the actual objects, old models of half a century back could be found, and so all the ateliers of the kingdom were ransacked, and out from the dust were produced the old moulds and forms which the genius of former and more inventive days had created. Here were productions from the hands of Falconnet, Clodion, La Rue, Boizot, Bachelier, Duplessis, all the illustrations of art at a period of abundant invention and a sensual exuberance. "In these may be remarked a wise proportion existing between the surfaces left to be painted and the happy mouldings; in the words of M. Jacquemart, there is to be found there what would make the most vehement enemy of the eighteenth century, and its errors, admire."

Among the forms in use between the years 1740 and 1780, we may cite as particularly elegant those of the vase Falconnet, the vase du milieu du Roi, whose graceful appearance recalls the best productions of goldsmiths' work, the vase écritoire, the vase fontaine Dubarry. In a form more simple, derived from the egg, it is the vase console rendered light by the deep depressions of its base, the vase à chaîne.

From 1780 to 1800, some modifications were introduced. In trying to purify the manners of the court, Louis XVI. essayed also to bring back simplicity in art; in 1785 he purchased from M. Denon his cabinet of antiques, destined to furnish new models of the French ceramic art, this collection has served as a base for the museum at Sèvres, where it still may be seen. The study of this second series is not without interest, the vase Bachelier, the vase aux garnis, the pure Greek urns, the vase Medicis with its antique bacchanal and its acanthus-leaves. But these transformations are not without some motives worthy of notice. Here it is Boizot, who, as if to follow the way opened by Clodion, develops on a slender vase, pretending to the Hellenic form, groups of amorini, impressed with the pure French style. This mixture, frequent in the product of Sèvres, during the second half of the eighteenth century, contributes powerfully to the charm of what is named the "style Louis XVI."

Before going further and seeking what has been in this century the progress of the manufacture of Sèvres from the point of view of form, let us say a word of the groups and figures. The collection of models, as complete as one can desire, is most instructive as a mark of national sentiment; at first occupied with imitating the Germans, and the easy pastoral subjects, the modellers follow the trace of Boucher and his meretricious school. But soon serious artists enter the manufactory, and introduce something better. Falconnet, rendered famous by the figure of the baigneuse, which opened the doors of the Academy to him, reduced with success his charming work, and produced others in the same style. There is yet another kind of group, created beyond a doubt by Bachelier, representing hunting subjects, in which wild boars, wolves, &c., are vigorously attacked by the doge.

With the nineteenth century, commences what M. Jacquemart calls "the era of the architects"; Percier, Brongniart, under the direction of the Baron Denon, produce those large vases borrowed from the Greek and Egyptian; and the best artists of the period assisted with their designs. The mechanism advances rapidly; busts the size of life, and pieces of furniture, are produced resplendent with paintings. About 1820, Chenavard introduces the ornamental style borrowed from the Renaissance; he is followed by Diéterle, making use of the chefs d'œuvre of all periods.

Among the colours called to decorate the porcelain produced at Sèvres, some have acquired, perhaps without meriting it, an immense reputation: foremost stands the turquoise blue invented in 1752 by Hellot. It so pleased Louis XV. that at first the courtiers named it bleu du roi, but that colour existed already, and the modern name was eventually given it. The second decorating colour is the rose Pompadour (invented in 1757 by Rbousset) which Marryat and others call rose Dubarry, although it was anterior to 1764.

M. Jacquemart protests against a statement made by our Marryat that in the first year of the French efforts the painters were so feeble that German help had to be called in; this appears to be incorrect, and arises probably from the great resemblance which exists between the early efforts at Vincennes and the works produced at Meissen, from the fact that both took their ideas from the same source; but nothing can be more different than were their styles as they became more established. Nothing shows better the character of painting on tender paste in France than the magnificent plaque, executed in 1756 by Castel, after Desportes, which is exposed in the museum.

The porcelains of the time of the First Empire are remarkable for the stiffness of their forms and the academic ugliness of their decorations. From this period commences the mistake of copying pictures and historical subjects on vases, plates, and other objects. In an article on the subject in the *Revue des Deux Mondes* of June, 1862, M. Adalbert de Beaumont has given some very determined and sensible views, desiring the manufacturers to look to Chinese decoration to learn lessons from, and not attempt what is not of the domain of pottery decoration.

At the end of the Second Empire the manufactory of Sèvres was enlarged by the addition of a number of new buildings at the extremity of the park of St. Cloud, and it is these new annexes which were to have been finished by 1869 that are now finally opened. At that epoch, the manufacture which costs 480,000 francs, and scarcely gains more than 80,000 francs from what it sells, fell into a terrible state of decay, and this was eminently remarkable at the exhibition of 1867. After the unhappy events of 1870-71, an effort was made to commence again, and in 1875 a competition was decreed, to take place annually, for a vase to be executed at Sèvres, the successful author of which was to receive 2,000 francs. At the same time a school of mosaic was founded.

The new buildings which have just been opened occupy a vast quadrilateral, the façade of which looks on the Seine. To the right and left respectively are the collections of the manufactory, which occupy four large rooms, and the offices and library. Of the two museums, one is destined to receive the works of artists of Sèvres, and the other, specimens of the pottery of all nations and all epochs. Both are unique in their way. The latter, we may mention, has just been enriched, thanks to M. Champfleury, the curator, by the purchase, for the sum of 8,000f. (320l.) of a Virgin in white faience, in the school of Lucca della Robbia.

The workshops are composed of several buildings, each of one story high, and all contiguous, which, however, will have to be connected by glazed passages. Only a portion of the manufactory is as yet installed in the new building, and it will be at least eighteen months before the complete change will have been made.

Nor must we forget to mention how, after the Marshal President had been shown the admirable architectural arrangements due to M. Landin, M. Robert, the director of the establishment, was decorated as an officer of the Legion of Honour, and M. Champfleury, the curator, an officer of the Academy. The recollection of this day will not remain vivid in their minds alone, and we hope that the wish expressed by Marshal MacMahon, who, in giving all praise to the perfection of the modern painter's art, regretted the degeneracy of the forms on which they exercise their skill, and expressed his confidence in the ability of the present art-directors of the establishment to encourage a return to a more faithful adherence to the beautiful models, of which so many examples exist for our admiration and emulation, may be fulfilled.

#### SOCIETY OF PAINTERS IN WATER-COLOURS.

THE fifteenth of the winter exhibitions, now open in Pall-mall East, is really, as the title-page of the catalogue describes it, an exhibition of "Sketches and Studies," and, moreover, it is a very good one of its class. We are glad to find the most important of our water-colour exhibitions keeping to the style of productions which the winter exhibitions were started for, and not presenting a mere repetition of the spring exhibition; and in regard to water-colour art this is all the more desirable, because a collection of drawings like this, in which finish is not the aim so much as effect, seems to bring us back a little

to the special characteristics of this art, its power of giving atmospheric effect and tone in landscape by a broad and comprehensive rendering, and with comparative rapidity of execution; whereas the recent practice of water-colour has tended so much towards minute finish and realism that the most marked capabilities of this medium of expression are in danger of being overlooked and slighted. Some of the contributors appear to us to show more power and artistic feeling in their slighter works in the present exhibition than in the average of their works for the spring exhibitions, simply because their attention has been turned less to finish and manipulation than to the expression of a thought or an effect.

We can only just refer to some of the best items in a collection including a great deal that is interesting. Among the few figure subjects Mr. Tadema's "Balneator" and "Balneatrix" (332, 353), companion works representing respectively a male and female attendant in a Roman bath, are little masterpieces both of character and colour, steeped, like all the artist's Roman subjects, in an atmosphere of habit and personality utterly alien from modern experience. Perhaps no historian has done more with his pen than Mr. Tadema with his brush in making Roman society under the Empire something like a reality to us. What a change to go from these to Mrs. Allingham's sweet and delicate studies of rustic children,—"Over the Hill," "May," "Little Johnny" (366, 388, 369), the latter a baby looking aimlessly out of a cottage window; little drawings whose quality is in inverse proportion to their quantity, and which would make one love children if one never did before. Among other figure subjects Mr. R. Thorne Waite's "The Ferry Side" and "Caught in a Shower" (121, 383) are very good, the latter especially. Mr. Radford's works have the same hard finish as before; "Caveat Emptor" is the best, but this artist has done nothing to raise the tone of the Society's exhibitions. Mr. J. D. Watson sends a good many of those studies of nooks of landscape with a figure or two, which he seems to achieve with almost too great facility, falling below himself at times; "The Rendezvous" and "Homeward" (151, 350,—high life and low life respectively) strike us as the best. Mr. Walter Duncan is vexatious; his "Cup of Tea" and "In the Stocks" (132, 151) are both indubitably original and both very ugly; the latter really almost vulgar. Some small studies by Mr. Lamont, Mr. Smallfield, and others, should be noted, and a clever sketch of a "Spanish Mendicant," by Mr. F. W. Topham (202); there are sundry sketches by Sir John Gilbert, too like many predecessors with the same kind of merits. Animal life is represented by two capital studies, by Mr. Riviere, of young lions and young tigers well known to the frequenters of the Zoological Gardens at present; by an admirable "Sketch of a Cow" (126), by Mr. H. Brittan Willis; and by Mr. Otto Weber's several landscapes with cattle, which are of rare excellence, and force us out of our usual indifference to "Cattle pictures."

At the top and bottom ends of the room the places of honour are given to a beautiful drawing by Mr. Alfred Fripp, "The Quarry Path" (95), and a very fine broadly-sketched "Surrey" landscape (258) by Mr. Thorne Waite; a model type of "sketch." The various sketches of Mr. J. W. North are marked by great individuality of tone and feeling, and a peculiar manipulation which at least exactly answers its author's object. The "Sea Belle" (111), a yacht coming lazily over an expanse of nearly calm sea, with broken reflections of sunlight, has "Mr. Francis Powell, his mark," imprinted on it with more than ordinary distinction of excellence; the same artist's figure-study, "Hesitation," (308), induces, we confess, the same mental attitude on the part of the critic. Drawings by Mr. Dodgson, Mr. Davidson (whose studies of Surrey landscapes are admirable), and the late Mr. Whittaker, are to be noted; Mr. Albert Goodwin has some admirable slight sketches, including a small view of "St. Michael's Mount" (357), remarkable for force and reality of colour; Mr. A. H. Marsh's "Evening" (277), a twilight lane backed by a high bank of trees deep brown against the fading light, is full of genuine feeling; Mr. Matthew Hale's "Low Tide, Sunset" (205), is a beautiful study of sunset colour and light. Among architectural sketches Miss Clara Montalba has two drawings, rather more than sketches, of the "Interior of St. Mark's" (147, 170); M. Carl Haag two interesting little studies of a "Temple of Bacchus in the Campagna," and an "Old Chapel



at Oberwesel" (65, 104), and "Old Houses at Bacharach," and a study of "A Gable at Cologne" (387, 392). Two or three little landscape-sketches by Mr. Marks are beautiful in their way, and much more to our taste than his designs for "The Months," which are not humorous, but only "funny"—a very different characteristic.

### THE CEMETERY OF CALLISTUS.

It had been feared that the works of the Italian archaeologists, among the Roman Catacombs, arrested seven years ago, would not be resumed; but an indomitable spirit has prevailed over the difficulties which then threatened, and a third series of discoveries will shortly be unveiled to the world. There is no chapter of written history more speaking and truth-telling than that which may be deciphered in these catacombs, enigmatical and mysterious though they frequently are. Their exploration has now been a ten years' task, and is, as yet, far from being completed. But the farther back they go the more delicate is the ground to be trodden, and the greater tendency, among the monuments, to mingle the Pagan with the Christian record. Of course, the field of conjecture widens from this point; but we are enabled, by the latest labours of the archaeologists, to select a particular ground for consideration, and this is the celebrated Cemetery of Callistus. It had been examined, to a certain extent, in and before 1869; but the new report will show that this examination was altogether superficial, and that even the outlines of that famous burying-ground were then scarcely known. Recent investigations suggest the inquiry whether it was not a Pagan converted into a Christian place of sepulchre. There are painted galleries and chambers; the arrangement of the tombs seems to date from before the first century; the brickwork employed is of an antique date, older than that used in the pavement of the Appian Way, and among the epitaphs are not a few which must have been, even in the days of Marcus Aurelius, those of long extinct families. That is a matter of antiquarian chronology, however, a discussion of which may be deferred, perhaps, until the "Third Statement" has actually been published. The one important historical fact is that this great burial-ground became dedicated to Christian uses before the reign of the Antonines, and that in it tradition recognises the tomb of Saint Cecilia, which, for eleven centuries, had been lost, with the inscription, half-obliterated,—*"I am free, I am noble, and I am the daughter of a Senator."* This is conjecture, no doubt, but the grave is unquestionably that of one who must have answered to such a description. Whether, therefore, its marble splendours belonged to the Saint of Song, or to one of her Imperial votaries, matters little. The Cemetery of Callistus means the cemetery of the Cecilians, at all events. It was at first their private sepulchre. Passing out of their hands, it became the property of Callistus, Pope Zephyrin's favourite deacon, whose ambition it was to have the bodies of the early Popes translated thither from the crypts of the Vatican. He procured it to be styled, in public documents, "The Cemetery," *par excellence*, as though no other existed, and traces are evident that, from and long after this date, it was the only one exclusively devoted to the burial of Christians. It grew, however, into a splendid grave, of which the description has been given to us, for the first time, now. M. Rossi began by identifying, beneath the dust and ruin of ages, the tombs of the third-century Popes, from Zephyrin to Miltiades,—all contained in a moderate-sized chamber, such as would have attracted little attention among the hollows of an Egyptian Pyramid. The walls and roof had fallen in; on the floor lay a heap of fragments, and a door at the further end was nearly choked. Penetrating it, however, by means of the axe and spade, the explorers came upon a magnificent gallery of mural paintings,—large spaces covered with superb decoration, wall-ornaments of tinted marble, fallen capitals of richly-wrought columns, broken pilasters, and sculptural fragments, suggestive of an exquisite art. It is pretended that the names of certain illustrious Popes, all belonging to the third century, are legible upon these remains; this, then, was the Papal Crypt, so it was believed at the time; yet the recent discoveries somewhat shake our faith in the confident "restorations" of M. Rossi, with his elaborate altars, tombs of saints and martyrs, and so forth. It is remarkable that in no instance does the Papal title

accompany the name. There is only the word "Bishop," with, in a solitary case, the addition, obviously attributable to a far later date, of "martyr." However, it is not claimed for the Popes that they occupy the entire cemetery of Callistus. On the contrary, it might be supposed to contain a nation of the obscure and humble dead. The earliest explorations were baffled, in every direction, by walls that seemed like the solid rock; but which have just proved to be no more than ingenious masonry. These, being broken through, expose, perhaps, a ruder method of excavation, and a more crowded disposition of the dead; yet the same characteristics obtain throughout, and the inscriptions, with a solitary exception, are in Greek, or Latin written in Greek characters. The latest discoveries sustain the former, so far as regards the perfect and pure simplicity of these early Christian epitaphs,—the name and date, followed by "Peace be with thee!" "Sleep in the Lord!"—no style, no title, no blazonry of achievements or of rank, though occasional ejaculations occur of intercession for the souls of the dead. All this is curious, and becomes more so the farther the investigations are carried. Still more interesting are the funeral frescoes so long hidden away in the darkness of these cavernous tombs. Christian art, we are often told, had its origin in the catacombs, and certainly it must have been nursed here at a very early age. It is to be suspected, however, that most of the sculpture brought to light in the course of the excavations was Pagan; that, for example, of the great sarcophagi, which are distinctly mythological in their adornments; one of them is wrought over every inch of its surface with incidents from the fable of Psyche and Eros, a fact lending probability to the theory that the catacombs existed long before they were adapted to the purposes of Christian secret assemblages or obsequies. At the same time we do find these early and obscure Christians condemned to meet, worship, and work in the privacy, as it were, of a tomb, imitating, in the matter of decoration, the Romans, the Greeks, and even the Egyptians, without hesitation or scruple, and Tertullian himself justifies the practice. To adorn the walls and vaults of their funeral chambers, they copied, from the boudoir and the saloon, arabesques, birds, flowers, winged genii, even nymphs, and all else that could give a grace to the home of death. In the Cemetery of Callistus was discovered, years ago, one beautiful fresco, representing Orpheus playing on the lyre, and quite recently, a strange apparition of the same heathen deity, transfigured into the image of Christ, with the Lamb, instead of the lion, at his feet. The age of this singular work it is impossible to ascertain; but it ranges with a large class, all exemplifying a transition of ideas from one stage of art and thought to another. In this respect the discoveries in the Cemetery of Callistus have proved invaluable. There have been found, too, a multitude of historical and dogmatic illustrations, especially in two chambers, adjoining each other, hollowed in the solid rock, and covered with illustrations from the Old and New Testament narratives. The discoverers, eight years ago, confessed themselves unable to interpret the symbolism thus expressed; but, with what accuracy it is impossible to say, they at length declare themselves capable of reading the entire parable, from beginning to end, which may be doubted, because, from what is permitted to be seen of the copies taken, the confusion of allegory with history makes up a cypher unintelligible without a key. Thus, Moses and Peter in one strike the rock; the water, at one point, sickens, and at another refreshes those who drink it; here a fish is a soul redeemed, there it is the Lord Himself; now the vessel bearing Jonah carries a cross upon its mast; there, a vast ocean is swallowing up the creation, from the ark to Julius Cæsar. It is a characteristic, and even grotesque, port-folio, the outlines and colours of which belong to a period long anterior to that in which Christian art began to be touched by an Italian grace; yet none the less valuable on that account. It was the rude, unassisted, independent expression of a faith, and the artists worked in twilight. They represented miracles, persecutions, martyrdoms; they drew the Jewish and the Grecian types on the same panel; they had no choice of pencils, colours, or canvas; their materials were as clumsy as their creed; and so they sought to whiten the sepulchres of Rome; and so, after many years, the monuments of their imagination and their industry have been found. Not all

barbarous or misshapen, however. Beyond, as we have said, rough and hideous corridors, resembling the corridors of coalmines, we have infinitely richer embellishments, incrustations of ornamental marble, miniature chapels of delicate sculpture, staircases carefully balustraded, though in the solid; on each side dark adyta plunged far down in a marvellous solemnity of silence and gloom, yet wonderfully wrought, as though the dead had sight to admire them; and, above, as though with the object of deception, airy, lighted galleries, which, in the age of Constantine, it is recorded, were lined with plates of silver, "shining like mirrors." They, of course, have disappeared, with thousands of the *graffiti* or tablets that might have told a precious history of the past. But the archaeologists are indefatigable, and declare that there are miles of excavations still to be made, when they hope to penetrate beyond even the march of ancient Vandalism, and detect traces which Time itself has spared. The Italian Government accords them every help, and when their latest chronicles are made public, it will doubtless be seen that they deserve it.

### "ART AT HOME."

UNDER this title a series of small treatises is being issued dealing with the subject of domestic art in various branches, of which the first two parts\* are just published. The idea is not a bad one, more especially as the volumes are so cheap as to come within the reach of a great number of readers; but unless the series is carried on better than it has been begun, it will hardly be of much value. The first part, "A Plea for Art in the House," by Mr. Loftie, is one of the most silly and shallow treatises we have had the misfortune to look into. The first chapter, a very long one, is all upon "the prudence of collecting"; in other words, the advantage, in a commercial point of view, of buying cheap what is likely to rise in value; than which we can hardly imagine a lower motive for purchasing works of art. The author's recommendations are seasoned with anecdotes which he seems to consider amusing. His ideas of decoration may be judged of from his description of the decorative scheme of a room in which the walls, being painted a cool grey, were made the ground for black-letter inscriptions painted at intervals diagonally up the walls, "a different slope being adopted, to avoid uniformity of effect." There is Mr. Loftie's notion of "design"; which would be an easy matter, at that rate, certainly. He confounds etching with engraving (p. 59), and sneers at the etchings of Whistler and Legros, which certainly may have a kind of excellence beyond the comprehension of a critic who on the next page thinks it necessary to tell us that if we frame on the wall one of the big prints which the illustrated papers occasionally "present" to their readers, we shall be "disappointed" with its effect. On the next page to this we read that photography, though of little use for portraiture, is very well suited for landscape (!). What we find a little further is still better:—

"To many people it will be new to hear that we had a school of art in England in the twelfth and thirteenth centuries, such as we have never had since, and that there were painters and sculptors among our ancestors in the reign of Henry III. whose works excel anything that has been produced in our island in the nineteenth century."

Such a statement, in regard to the country of Flaxman, Reynolds, Gainsborough, and Turner, is simply impudent; one of the silly paradoxes by which shallow and pretentious writers pass themselves off upon more ignorant people as very profound critics. However, after this specimen we may quit Mr. Loftie's lucubrations, merely regretting that an apparently well-intended project should have been started so badly.

The second part, "Suggestions for House Decoration," by the Misses Garrett, deserves a different reception. They aim especially at promoting artistic treatment of middle-class houses, where good taste, without ostentation, must be the aim. The average house, as it is at present, is described, truthfully enough, and without any unnecessary attempts to be witty at its expense; and the details of the improved picture are then suggested, for the most part sensibly and practically, and with good taste up to a cer-

\* "A Plea for Art in the House," by W. J. Loftie; "Suggestions for House Decoration," by Rhoda and Agnes Garrett; Nos. 1 and 2 of the "Art at Home Series." London: Macmillan & Co.



tain point. The necessity for this reserve in commendation arises in the partiality of the authors' studies, which are based upon the facts of a single and very corrupt style (not, indeed, to be called strictly a style at all) instead of the general principles of style, of which they seem quite unconscious. They have based their ideas of what is right and in good taste solely upon the "Queen Anne" manner, and, knowing nothing of design beyond this, seem to imagine that no one else knows any more either, and that the whole theory of architecture and decorative design is comprised within the horizon of the very small but rather self-sufficient clique of "Queen Anne" architects and dilettanti. They are kind enough to tell us (p. 55), that "much has lately been done by the architects and designers of the Queen Anne school to improve the public taste"; the *naïveté* of the remark, implying that nothing had been done to "improve public taste" until the Queen Annists came to the rescue, is really delightful. They commence their "introduction" by stating that "not long ago, at a meeting of the Royal Society of British Architects, a paper was read upon 'the Queen Anne style of architecture.' This was followed by a discussion, of which not the least curious part was the evident wish to disbelieve in the existence of such a style. One venerable professor went so far as to ask querulously where he could see any examples of the so-called style, with a sneer in the pronunciation of the last word which it is not possible to express by any form of print." No corporate body under the title of the "Royal Society of British Architects" exists; however, we know what body is intended to be referred to; but as the paper in question was not read at a meeting to which ladies are invited (though we see no reason why they should not be), it is difficult to understand how the Misses Garrett could be able to describe so graphically the peculiar sneer of the "venerable professor." What we are quite sure of, however, is that the venerable professor knew a great deal more about the matter than these young ladies, who think themselves competent to criticise the whole architectural world, either know or are likely to know, unless they extend the range of their studies a good deal. The fact is that, what is called Queen Anne architecture is not a "style," but simply a "manner," which is a perfectly different thing. It is true, as the authors observe, that since the occasion above referred to a good many houses have been built in this manner, and that it has shown signs of getting popular. That, however, no more makes it a style than the popularity of obignons and crinoline made them tasteful adjuncts of costume. If the Misses Garrett wish to know what constitutes "style" in architecture and ornament, we may refer them to No. VI. of Viollet-le-Duc's Lectures on Architecture. That they do not know at present is obvious; for in the illustrations and the letterpress they recommend things absolutely at variance with any true idea of style: for example, they recommend (p. 62) the adoption of the "old-fashioned door-head" in interior doors, by way of obviating "the ill-proportioned and mean-looking" appearance of the ordinary room-door as it is at present. What they mean to recommend is the pedimented doorway familiar to us in Jacobean as well as Queen Anne interiors. Now, did it ever occur to the Misses Garrett to reflect for one moment what that feature really is? It is a slice of the Classic architrave, frieze, and cornice, cut out from the Greek building (or, rather, the Roman corruption of the Greek building), where every feature in it had a meaning, and applied where it has no meaning whatever; and it is the execution, moreover, in framed wood of details which originated in, and are only really suitable to, built-up masonry. Aesthetically and constructively the feature is in reality opposed to the most fundamental principles of true taste and "style," which imperatively demand that every feature in such a construction should arise from the constructive method employed, and should be such as the nature of the material suggests. The sideboard, again, shown in the illustration forming their frontispiece, is simply a misapplication of stone architectural forms, very badly used and shorn of the proper proportions, to a piece of wooden furniture. To the Greek architect, whose details are here stolen and vamped up again, such a thing would probably have appeared utterly absurd; it is only the prevalence of specimens of this false and uninstructed taste, which the Misses Garrett are here once more recommending, which prevents many who are used to them from feeling them as such. Again, in the two illustrations of

a drawing-room (pp. 61, 62), the furniture in the first one is in a very good and truthful wooden style, while that in the second illustration is totally different in style, and about as bad and weak as can be: yet the authors seem to see no difference, and equally recommend both. In short, the book has no basis in art-principles whatever; it is simply based on an exclusive admiration for Queen Anne furniture. Now, the study of no one style, even a good one, can afford a basis for critical principles, still less the exclusive study of one which all whose tastes are better founded than to be shaken by every new fashion, know to be full of blunders, contradictions, and offences against pure taste. If the excellent ladies who write this treatise merely profess to be decorators in the Queen Anne style, well and good; every one has a right to his or her taste, and we have had ocular evidence that the Misses Garrett can do much better in the actual treatment of room-decoration than their illustrations here would lead any one to suppose. But we must really hint that a proficiency in this branch of artistic work scarcely gives its practitioners a critical insight into the whole subject of decorative art: and, as to architecture, we are of opinion that they simply do not understand what it is. When they learn in what architecture, as "the art of building nobly," really consists, and at the same time discover how much more there is to know about it than they have yet found out, they will perhaps see that their dogmatic tone in regard to the subject is out of place,—not to say just a little absurd.

#### PERSONAL LIABILITY UNDER THE NUISANCES REMOVAL ACT.

WHEN a prime minister has announced that the prominent feature of his home policy is the improvement of the sanitary state of the country, this subject obtains even greater notice than it would attract from its own inherent qualities. We propose, therefore, very shortly to point out the bearing of some important legal decisions on personal liability under the Nuisances Removal Act. In the first place, it is well that the public generally should know the rights they possess against those who cause nuisances; and in the next, there are, no doubt, persons who may from time to time be dragged into litigation rather from ignorance of their position than from any distinct wish to violate the law. Everybody, says a well-known legal maxim, is supposed to know the law, a maxim which any one who is aware of the vast mass of modern statutes and judicial decisions must consider more hopelessly absurd than even most maxims, which, as Macaulay remarked, are only useful in children's copy-books. The Nuisances Removal Act (18 and 19 Vict., c. 121) enacts that "the person by whose act, default, permission, or sufferance the nuisance arises or continues" may be summoned before the justices, who may make an order on such person for the abatement, discontinuance, and prohibition of the nuisance. From this it is quite evident that, if from want of care or from wilful neglect works are constructed so as to violate this Act, they may be a source of great loss to the owner; for it must be pointed out that this section has a very wide bearing, and that the Courts of Law have held that these words apply indirectly as well as directly.

It is this question of what may be called indirect liability that is the most important to be properly apprehended, for when a nuisance is directly caused by some person there can be little doubt of his liability. The test of indirect liability which appears to us to be the surest one for discovering the true bearing of this point may be shortly stated as follows:—Would the nuisance have arisen if it were not for the act of the person alleged to have caused it? If it would not, then even though others may be apparently blameable, this person whose act is a cause *sine qua non* in the matter is liable under the Nuisances Removal Act. We shall so simplify this proposition, which we have stated in a form capable of being apprehended by lay readers, by the facts of two cases, one of which was decided, in the course of the present year, whilst the other took place about ten years ago.

In the first case, *Brown v. Busell* (37 *Law Journal, Magistrates' Cases*, p. 65), a brewer at Esher had discharged the sewage and refuse-water from his works into a covered drain running along a turnpike-road. This drain ultimately discharged itself into an open ditch or water-course on the Sandown Park Estate. For many years the owner of this estate had

used the contents of this open drain for the purpose of irrigating and fertilising his land. A subsequent owner discontinued the practice, and hence this open drain very naturally became a nuisance to the locality, for the sewage water had then to run off the Sandown Estate into various open ditches. The question arose, was the brewer liable under the Nuisances Removal Act? It will be evident that here he was clearly not the direct cause of the nuisance, but that without the refuse water from the brewery it would not have arisen. Even if there are other persons who are also the cause of it, this will be no excuse for any one who is clearly also a cause for the present. Lord Blackburn observes, "if it is proved that a man sends from his premises enough refuse to cause a nuisance, it is surely no answer for him to say that there are other persons who cause a similar nuisance. He himself causes a nuisance and may be ordered to abate it."

Turning now to the more recent case of the *St. Helen's Chemical Works* against the Mayor of St. Helen's (45 *Law Journal, Magistrates' Cases*, N.S., 50), we find that there was first of all a public sewer forming part of the drainage system of the town of St. Helen's. Next that sulphuretted hydrogen gas was generated in the sewer below the works of the company, and escaped into the street from this main sewer in such quantities as to be injurious to the health of the inhabitants and passers by. Next came the cause, namely, two drains from the Company's works, which they had a perfect right to use to drain their works into the public sewer, down one of which came liquid impregnated with muriatic acid, and down the other liquid impregnated with sulphur. These elements combining and mingling with the sewage and with each other caused the various gases. But there was also this important fact: that if the main drain had not been improperly trapped the gas would not have escaped. Nevertheless, the Court held that the Company was liable under the words of the Act which have been already given. Here was essentially an instance of indirect liability. But whilst, no doubt, this very extensive personal liability should be enforced by the law, it is still impossible not to see that a certain amount of injustice was done in this case. Because, although Mr. Justice Grove observed that if the sewer was completely trapped, it might burst, yet no such inference was stated in the case before the Court. The direct fact was, that the sewer was improperly trapped. So that to place all the liability on the person without whose intervention the nuisance would not have arisen, and to let the person or corporation go scot free by whose approximate neglect the nuisance was not prevented, seems to be stretching the Act almost further than is quite justifiable. We do not wish to prevent persons from being liable for nuisances they commit,—let the law be stringently administered—but at the same time influential corporations should not be permitted to escape scot free when they neglect their duty. But with these observations we may fairly commend these two examples to our readers as clear instances of the law which has been stated in the proposition at the commencement of this article, and which at the present time should be well understood by all whom it may concern.

#### DAMP.

ONE of the effects of the changeable weather that we have had lately has been to draw attention to that terror of housewives—damp,—an evil which, with all the apprehension that it engenders, is but little understood, and very inefficiently guarded against, both in the design of a building and in its subsequent management.

That form of damp which is caused by the absorption of moisture from the soil is so well known, and the ordinary precautions against it—such as the dry area and the damp-proof course—are now so commonly employed, that it is unnecessary to do more than mention them. The damp which affects the upper part of a house—its wall surfaces, fittings, and furniture—requires more particular study and more care in counteracting its effect.

The third week of November began with severely cold weather that would penetrate into any imperfectly-warmed house where the access of air is pretty free. To this succeeded a day of soft, warm, heavy weather, the air being filled with moisture. On the Thursday the internal walls of the staircase of a house in the City of London, with which I am well acquainted, and which was built with unusual care in all



respects about twenty-five years since, were covered with moisture so as to produce the effects following:—Upon the smooth, hard plastering, which is painted with a "bastard flat" surface, beads of water formed similar in appearance, but larger than those often seen on a window-pane. They then ran together, and streamed down the wall, till the whole surface was covered with water as if it had been laid on with a brush. The water settled first upon the skirting, and then ran down to the stone steps and landings, on which it spread itself in pools for as much as 6 in. from the walls. The steps were otherwise dry, but the polished mahogany handrail was thoroughly wet, the water running down it to the bottom. A painted wooden ledge, 2 ft. by 1 ft. 3 in., that is bedded on brickwork, and on which a certain portion of the wall and of the handrail could drip, was covered with as much water as it would carry.

Now if anything like this had happened to the external wall of a house having a south-western aspect, it would have been assumed that the moisture had come through the walls, although when the same thing happens to a window nobody is so ignorant as to think it has come through the glass. The bricks would have been blamed, and such devices as indurating solutions, or cementing the external surface, would have been suggested. It is therefore important to remember that this is an internal wall, and one that is exceptionally sound and well finished. Moreover, the external walls of rooms in the same house (hung with varnished oak paper) were not observed to be damp, though the staircase walls of another house had their varnished paper somewhat blistered, for a time, through moisture.

This dampness is, of course, due to the deposit of moisture by the air upon those surfaces that are best fitted to attract and retain it, just as the night dews are deposited upon the grass. The unusual cold of the preceding days had penetrated easily into the staircases, less freely into the rooms. Then came the warm south-west wind, laden with moisture, filling the staircases, penetrating less readily into the rooms, and parting with its moisture freely to the cold, hard, smooth surfaces, but less freely or not at all to such as, being rough and porous, were bad conductors of heat. Thus, painted or polished surfaces will become more wet than such surfaces as are presented by stone, by the softer kinds of wood, and by unvarnished paper, and, where the damp penetrates into a cold, neglected bedroom, the blankets are less affected than articles of cotton or linen.

The effect upon the walls of a church at this time was to produce damp patches upon the moderately smooth plastering, but not on the Bath stone window-dressings that were coloured like the plastering of the walls.

The remedy for this form of "damp" is clear, and it seems a pity that it should be necessary to enforce it at this day; for the old-fashioned house-wives were well aware of it. It is to keep the house or other building well warmed by means of ordinary fires, or, in the case of large buildings, by hot-water pipes, or such means as will most economically supply warm air, in times of excessive cold, in sufficient quantity to keep the warmth in the wall surfaces above the point at which the moisture in the atmosphere begins to condense. This warmth, having been kept up during the period of excessive cold weather, should be continued, to some extent, during the succeeding damp weather, in order to check the tendency which the air then has to part with its moisture. In a small house, the two or three fires which are usually kept burning in the kitchen and living-rooms are sufficient to keep up a certain degree of warmth in the staircase and the bedrooms, through the circulation of air which takes place when doors are frequently opened; but this becomes insufficient in times of unusual variation of temperature, and for most houses the provision of a stove in the hall or staircase (perhaps a small gas-stove) supplying fresh warm air from without, would be a great source of comfort, dryness, and health. In a large house such a provision is essential, and in all houses occasional fires should be lighted in all the bedrooms and spare rooms, particularly in cold and damp weather. If people will keep up the absurdity of a "best room," they can surely contrive to live in it once or twice a week during the winter, for the sake of keeping out the damp.

Perhaps the case which most requires care in respect of damp is that of a church,—especially

a village church,—unless the parishioners are willing to keep it in the state of neglect which has by habit become characteristic of the place. The best way to keep a church dry is to fit it with one of the stoves which have a fresh-air flue conveying air from the outside of the church first to some sort of heating chamber, and through it to the interior of the church. The fire should draw its supply of air from the body of air within the building, for by this means it will draw in the fresh air, and thus keep up a constant renewal of the air in the building, and produce at once warmth and ventilation. The ordinary arrangements of hot-water pipes produce the warmth, but not the change of atmosphere.

*Damp arising from Human Breath.*—If we breathe upon anything that is smooth and cold, as upon glass, it becomes clouded over with moisture. If a room full of people continues for any length of time without sufficient change of atmosphere, their breath parts with its moisture to the smooth parts of the walls, the windows, and other smooth surfaces. This is most noticeable in cold weather, but it goes on in all states of the temperature. The remedy for this evil is not the mere warming of the atmosphere and the walls, but the introduction of a copious supply of fresh air, together with the expulsion of that which is damp and otherwise vitiated. In cold weather a sufficient apparatus on the principle above described will effect this most easily. In warm weather the fresh air should be introduced directly into the room, instead of being passed through the stove. It may be introduced by such means as the ordinary hopper ventilator, Sheringham's ventilator, or, in exceptional cases, by the vertical tubes which it has been attempted to patent; the object of all these contrivances being to direct the current of air towards the top of the room, and so to avoid draughts. Some considerable change of atmosphere may also be effected by these means alone, or by open doors and windows judiciously contrived without the aid of heat.

*Damp arising from the Burning of Gas.*—I believe that gas-lighting as a cause of damp has never been recognised by writers on this subject, though the way in which water will condense in the long chimney or flue of a "ventilating globe light" has been noticed. In a paper which I read before the Society of Arts last year ("Health, Comfort, and Cleanliness in the House"), an abstract of which was published in the *Builder*, I gave some hints on this subject. A few particular instances, such as I am now frequently observing, will best show the nature of this evil.

I was first led to notice it in a mansion which was designed by me a few years ago. When it was on the point of completion, I advised my client to keep up plenty of fires as a means of drying the plaster, and to open the windows on all dry warm days. The price of coals had then risen considerably, while gas remained cheap, so he had temporary burners fitted, and burnt gas night and day. On my next visit I found the plastered walls, which before had been simply moist, covered with a heavy dew, the ceilings were in the same state (but in a less degree), except where they were heated by the gas flame. The plasterer observed how nicely the walls were "drying out," and my client was much pleased. I was as much dissatisfied, for, in my experience, the water contained in plaster does not dry out in drops, but in the form of insensible moisture, which is conveyed away by the atmosphere. As this is a common error, I would point out that whenever new plaster is wet with beads of water this is due to condensation of moisture from the air on the cold surface of the wall. On several weekly visits I found matters grew steadily worse, but as I had amply protested, and was seeking information on the subject, I was not sorry to watch the experiment. It did not come to an end till I asked my client whether more water had not run down a particular wall, or been wiped off its surface with cloths, than had been put in to make the plaster.

In the meantime, an equally interesting experiment was going on in the cellar under the dining-room, the floor of the latter being pugged and ceiled below. Communication with the outer air was cut off, and flaring gas-jets were lighted. The moisture that soon began to stand in beads on the ceiling (away from the heat of the gas) soon formed one sheet of water, and then the ceiling became hung with large drops containing half a teaspoonful of water, which fell on the floor, till that became wet also. My client, who had full charge of his cellar, insisted, with British obstinacy, that all this was "damp" rising from the floor, and from an old well. I

lived and learned, till one day the late Dr. Letheby kindly gave me the approximate amount of water produced by the combustion of 1 ft. of coal gas with the needful quantity of air, the hydrogen in the first combining with the oxygen in the atmosphere. In that house 500 ft. of gas were being burnt per day, and I calculated that during the "experiment" not less than a hog-head of water had been produced. Any one may satisfy himself as to this by observing the phenomenon which first gave me the hint as to this cause of damp. Light an argand gas-burner fitted with a clear glass chimney: in the first moment a flush of moisture, like condensed breath, will appear in the chimney; the next moment it will disappear, being vapourised by the heat of the flame. But the moisture continues to be produced, and will go about the room (or even about the house), searching for any damp corner or cold wall where it may settle. There is also moisture produced by the burning of oil lamps, but to a much less extent. I have had complaints of "damp" which affected the clothes hung up in mahogany wardrobes, and which could be traced to nothing but the excessive consumption of gas which many people practise to save trouble,—lighting up every burner at nightfall, and thus keeping the whole house light and warm. I have just had to report upon the damp which is destroying the paper in the handsome drawing-room of a well-built house, where, after observing that these walls were the only walls in the house that exhibited signs of moisture, I found it was the practice to light up a large chandelier early in the evening, the door being usually closed, and no fire kept up as a general rule. From the same cause a friend had his drawing-room thoroughly drenched with water one very cold Christmas, the gas having been kept burning night and day in the closed room during the absence of the family.

With regard to public buildings, I have just been in a church that I have recently completed, and found the windows covered with water, and the walls patchy with moisture, through the gas having been burnt for a whole day in order to warm the building for Wednesday evening service, every means of ventilation being at the same time closed. This is a constant habit in many churches where choir practice or short services are frequent, and is highly objectionable.

One other instance is instructive as showing the effect of different ways of "finishing" wall-surfaces. I sometimes attend concerts in a building which is two or three years old. The walls of the room are designed with pilasters, which were finished in polished parian cement, the panels between them being in ordinary plaster. When first used the room was unpainted, and the moisture from breath and from the gas condensed on the smooth pilasters only. The whole wall-surface has been lately painted, and now, when the ventilation is inadequate, the moisture condenses pretty equally all over the wall.

The remedy is, first, to burn as little gas as possible, and next to apply all the means of ventilation I have noticed, particularly such as keep up a supply of warm fresh air and a draught of spent air towards the fire. Polished surfaces should also, where possible, be avoided.

Without questioning that in many instances the dampness of a house is rightly attributed to the driving of rain against the walls, I am satisfied that it usually arises from one of the causes here indicated. I believe that frequently where the ties used in hollow walls seem to transmit the damp so that one may count them by the wet spots on the paperhanging, the real cause of the damp is that the ties have simply carried off the heat from the inner face, and so facilitated the condensation of the internal moisture of the house on these particular spots. I am sure, however, that the subject urgently requires attention, and ought to be better understood by persons who are responsible in any way for the condition of houses and public buildings.

THOMAS BLASHILL.

**South Shields Builders' Association.**—The annual dinner of the South Shields Master Builders' Association was held on the 22nd ult., and was attended by about sixty gentlemen. The chair was occupied by Mr. E. Suddards, president of the association, and the vice-chairs by Mr. William Harwood, vice-president, and by Mr. James Pollard. Mr. Councillor W. H. Bell proposed "Success to the South Shields Master Builders' Association," to which the chairman responded.



PRIVATE BILL LEGISLATION FOR THE  
NEXT PARLIAMENTARY SESSION.

NEW PUBLIC WORKS, TOWN IMPROVEMENTS, &amp;c.

THE notices in respect of private Bills to be applied for during the session of 1877, which have been deposited during the present week, in accordance with the Standing Orders, show that several projects of an important character are intended to be prosecuted. The entire number of Bills for which notices have been given is about 250, in addition to which there are no less than 50 Board of Trade and Local Government Board applications, in respect of undertakings of a varied character, bringing up the aggregate number of projects for which Parliamentary sanction will be sought to about 300, and closely corresponding with the number dealt with last year. The applications in respect of railways are upwards of 100 in number, of which 60 are in connexion with English lines, 12 Scottish, and 8 Irish. There are 9 Tramway Bills, in addition to 4 Board of Trade applications. The gas and water Bills are 40 in number, besides 16 Board of Trade applications. Town improvements form a prominent feature in the list, there being several Bills in which building and sanitary powers of a very extensive character are sought by the local authorities of the different large towns in the country. There are likewise several Bills in connexion with piers and harbours, together with others of a miscellaneous character. Of the entire number of Bills 24 are in respect of undertakings within the metropolis.

The proposed railway works affecting the metropolis include a project by a new company for the construction of what is designated the Greenwich Extension line, consisting of a new railway from the Blackheath Station of the London, Chatham, and Dover Railway to the east end of London-street, Greenwich, to form a junction with the Greenwich and Woolwich Extension of the South-Eastern line. A new company have a Bill for constructing a subway under the Thames for railway traffic, between Greenwich, and Millwall, and the Isle of Dogs. The proposed line is to commence in Poplar, on a piece of ground belonging to the London and Blackwall Company, and terminate in Greenwich at the junction of Billingsgate-street and Church-street. The Midland Company's additional powers Bill contains a clause for the purchase of land and buildings in St. Pancras, between King's-road and the Regent's Canal, for the enlargement of a goods station; also powers to purchase land and buildings for station and other accommodation, near the Hammersmith Extension of the Metropolitan District line, between the Lillie Bridge Works of that Company and North End-road, and to enter into traffic agreements with the Metropolitan District Company. The Great Northern Company seek powers to construct a new line in Hornsey from their main line to the Tottenham and Hampstead lines in Tottenham; also powers to purchase land and buildings in Hackney, near the North London line, for new goods warehouses; and also land in Caledonian-road, Islington, and near the company's cattle station in Caledonian-road, for station enlargements. The London and South-Western Company's Bill contains clauses sanctioning the closing up of several thoroughfares in the neighbourhood of Waterloo-road, Lambeth, in connexion with the enlargement of the Waterloo Station; and also powers to purchase land between the Wandsworth-road and Nine Elms for the enlargement of the Nine Elms Station. The London and North-Western Company's Additional Powers Bill contains clauses empowering them to purchase land and buildings for new works, and for that purpose to divert King Henry's-road, Regent's Park-road; also powers to widen the company's line near Chalk Farm-road. The London and Blackwall Company promote a Bill seeking powers for the construction of a new line and an extension from Stepney to Bow. The London and Brighton Company's Bill contains clauses empowering them to make a new junction line at Mitcham; also powers to purchase the Deptford Wharf, and to enter into agreements with the London Bridge Land Company, with the view of enlarging the London Bridge Station. A new company, designated the Kew Bridge and Ealing Railway Company, promote a Bill for the construction of a line from the South-Western line at Kew Bridge to Ealing. The Metropolitan Company apply for powers to purchase lands and buildings in Aldgate, High-street, consisting of Ball's-yard, Aldgate, and other property, and also property in the Minories, in order to enable

the company to construct a tunnel under Aldgate, in continuation of the Aldgate High-street Station just opened. The Great Eastern Company have a Bill for the construction of a new branch line between Enfield, Edmonton, and Tottenham.

The Metropolitan District Company apply for a Bill to construct branch lines and junctions with the Hammersmith and City, and South-Western and Great Western Railways, and to build a new station at Westbourne-park. A new company, called the "Metropolitan Central," promote a Bill for the construction of an underground line from the Portland-road station of the Metropolitan to Oxford-street, at its junction with Great Portland-street; and powers are also sought for the construction of another new line, called the "North Metropolitan High Level," from the Metropolitan and St. John's-wood to Hampstead-heath, Hornsey, and the Alexandra Palace line of the Great Northern Company.

The London Street Tramways Company promote a Bill for powers to construct additional street tramways in Pentonville-road, and to form a junction with the North Metropolitan tramways in Holloway-road. The North Metropolitan Tramways Company seek powers to make new lines in Kingsland, along the City route, Limehouse and the Hackney route, and New Oxford-street and the Old-street route. Their Bill also contains a clause sanctioning the use of other than animal power in working their lines.

A new company, called the "London Central Tramways Company," apply for powers to lay down tramways between Farringdon-street (Ludgate-circus), King's-cross-road, Pentonville, and Camden-road.

A Bill is promoted for making a subway under the Thames between Limehouse and Rotherhithe; and Mr. J. Barnett, C.E., also gives notice of his intention to apply for powers to construct a bridge, together with loop-bridges across the Thames, between Little Tower-hill and Horse-lydown.

Amongst the gas and water Bills is one promoted by the Sunningdale District Water (new) Company, for powers to construct new works for the supply of Sunningdale, Chertsey, Egham, Staines, and the neighbourhood. The Kent Water Company, the West Surrey Water Company, and the Croydon Gas and Coke Company, have each Bills for new works, and extension of limits of supply.

The Metropolitan Board of Works promote three Bills, the most important of which is their Street Improvement Bill, a measure of a very comprehensive character, and under which the Board also asks Parliamentary sanction for the extension of the Thames Embankment at Millbank. The street improvements are divided in the Bill into various sections. The Charing-cross and Tottenham-court-road and Piccadilly improvement will consist of six distinct new streets between the Regent's-circus, Piccadilly, Bloomsbury-street, and New Oxford-street, and will involve the widening of Piccadilly, Coventry-street, Princes-street, Tichborne-street, and Great Windmill-street, with a new street from Trafalgar-square, rendering necessary the removal of a portion of the steps of St. Martin's Church and the curtilage of the National Gallery. The street terminates at Tottenham-court-road, near its junction with New Oxford-street. The Millbank improvement involves the widening of Abingdon-street from the south end of the Houses of Parliament to a point opposite Great College-street; also the widening of Millbank-street and Grosvenor-road, together with the embankment of the Thames southwards as far as Mowlem's wharf. The Gray's-inn-road improvement provides for the setting-back of the east side of Gray's-inn-road from High Holborn to Henry-street, and a new street from Gray's-inn-road at its junction with Liquorpond-street to Mount Pleasant-street, Coldbath-square. This street will be partly carried across Tothill-street, Laystall-street, Great Warner-street, and Coldbath-square, by a viaduct. The widening of Kentish-town-road and Monte Video place is another of the improvements. The "Angel," Islington, improvement comprises the widening of Goswell-road and St. John's-street-road. The Southwark Bridge-road and Great Dover-street improvement consists of the making of a new street from Southwark Bridge-road to Blackman-street, Borough, near the church of St. George the Martyr. The several other improvements contemplated by the Bill consist of the widening of streets in the neighbourhood of Tooley-street and other parts of Bermondsey, Rotherhithe, Camberwell, and Peckham respec-

tively; also the widening of Deptford Bridge on both sides, and the widening of Greenwich-road for a length of 300 ft. Of the other two Bills promoted by the Board, one provides for the consolidation of the bye-laws as to the management of parks, with power to contribute towards the formation of a recreation-ground at Forest-hill; whilst the other Bill is that known as the Thames River Prevention of Floods Bill. Jointly with the Corporation the Board also promote a Bill for freeing the Thames bridges from toll. The Alexandra Palace Company promote a Bill seeking powers to sell part of the Palace grounds, with provisions for keeping up the remainder, and carrying on the business of the Palace, together with agreements between the Muswell-hill Estate Company and the Palace Company. The Crystal Palace Company also apply for a Bill, which provides for the reduction of the nominal stock of the company, and the re-arranging of the capital; also to provide for the transfer to the company of the Crystal Palace Aquarium Company and the Wurtemberg Stuffed Animals Company; and to empower the company to raise new stock to enable them to carry on business within the Palace.

The Richmond guardians, as the Richmond Rural Sanitary Authority, apply for powers to purchase four acres and a half of land on Barnes-common, and one acre of land in Mortlake, the land to be purchased on Barnes-common being for the purification and disposal of the sewage of Barnes, Mortlake, and Kew, the construction of a pumping station, and other works. The land at Mortlake is also to enable the promoters to erect a pumping-station for the purpose of lifting the sewage. The sewage is to be conveyed off the lands by an outfall sewer, to be constructed, and the Bill provides that the effluent water, after purification, is to be discharged into the Beverley Brook, and thence into the Thames.

The Bills promoted by the several leading railway companies seek powers for the construction of new branch and other lines in the different counties through which they pass, and the Midland, London and North-Western, and Great Northern Companies apply for Parliamentary sanction to build hotels at their several stations, and furnish and conduct them by their own servants. The Midland and Great Northern Companies likewise seek powers for the construction of an aqueduct in the river Nene to the Companies' pumping-station and engine-house at Peterborough, for the purpose of taking water from the river Nene. The Bill of the Lancashire and Yorkshire Company provides, amongst other things, for station enlargement, and other large works at Bolton, including the closing and absorption of streets, and the construction of several bridges. The new projects include a railway under the river Mersey, between Liverpool and Seacombe, as distinguished from the "Mersey Railway" project, for which an Act of Parliament has already been obtained.

Amongst the pier and harbour projects is a Bill promoted by the Dover Corporation, in which for the purpose of sea defences, they seek powers to extend the Revetment Sea Wall and Promenade, together with powers to strengthen Castle Jetty, and to execute other works for protecting against incursions of the sea the lands and houses at the base of East Cliff. The Wisbech Dock and River Nene Improvement Board have a Bill applying for powers to make a diversion of the river Nene at Wisbech into a new cut; also the conversion of part of the existing channel into a dock and float, with quays, wharfs, warehouses, and sheds. It is also proposed to construct four bridges across the new cut, and a tunnel under it. The Ipswich Dock Board apply for powers to make a new entrance lock, together with a new pier, jetty, and bridges, and also to lay down tramways in connexion with the dock. The river Wear Commissioners apply for powers to remove Hendon Rock, and to erect protective works at the south outlet. The Hull Dock Company have a Bill seeking powers to purchase the Citadel Estate and Earle's shipbuilding and engineering establishment, for dock and warehouse extension. The King's Lynn Dock Company apply for powers to enlarge the present dock, and construct a new one, with wharfs, sheds, warehouses, and tramways. The proposed new dock will be eight acres in extent, and will be constructed on land belonging to the Norfolk Estuary Company. The Bristol Port and Channel Dock Company seek powers to construct a new graving dock, and two new piers, 450 ft. and



150 ft. in length respectively. The Maidstone Corporation apply for powers to construct a new bridge across the Medway at Maidstone. The Margate Corporation include in a comprehensive Improvement Bill powers to construct a sea wall and embankment on the beach or foreshore, for the protection of the cliffs within the limits of the borough as proposed to be extended.

The Bills in respect of town improvements show that many of the large municipalities are alive to the importance of possessing increased powers for the sanitary and general government of their respective localities. The Wakefield Corporation promote an Improvement Bill which includes large and varied powers. These comprise the purchase of the water company; also general powers with respect to laying out of streets, and the width of the same, together with sewerage and drainage; control over the erection of buildings as to site, elevation, mode of construction, materials, nature of foundations, thickness of walls, levels of cellars, spaces to be left between houses for ventilation purposes, construction of roofs, chimneys, and flues, height and dimensions of rooms, number and size of windows, and construction and ventilation of drains. Powers are also taken to close and remove uninhabitable houses, and there is likewise a clause in the Bill empowering the Corporation to build a new town-hall and police buildings. The Over Darwen (Lancashire) Local Board have a Bill, in which they seek powers for the improvement of the river Darwen, by scouring and dredging, and improving the channel and the river banks, so as to preserve a free and uninterrupted flow of water. Also powers to discontinue the use of and remove existing cesspools and ashpits, and to construct cesspools and ashpits of an improved character. Also powers to alter the present minimum charge for water supply. The Gateshead Corporation have a Bill empowering them to construct public pleasure grounds and carry out street improvements. The Newcastle-upon-Tyne Corporation also promote an improvement Bill, including powers for the widening of streets, powers to purchase a site on which to erect a free library, and also powers to enable the Corporation to construct tramways. The Leeds Corporation apply for an improvement Bill containing very comprehensive powers. The Bill includes powers to purchase both gas and waterworks, and to construct additional works; also powers to acquire land for sanitary purposes, and to remove dilapidated houses; powers to erect houses for the labouring classes, also hospitals, mortuaries, public dairies, cowsheds, bakehouses, and public water-closets; additional powers as to the regulation of streets and buildings, and powers to prevent the erection of houses and buildings on ground filled up with offensive materials. Powers are likewise taken for the construction and widening of streets on an extensive scale; for the building of a new police station, and for the construction of parks and recreation grounds on several hundred acres of ground to be acquired on Holbeck Moor and othersuburbs. The Middlesbrough Corporation in an Improvement Bill seeks powers to erect a new market, slaughter-houses, a new town-hall, and police offices, on 15,955 square yards of land to be purchased for the purpose. The Ashton-under-Lyne Corporation promote a Bill empowering them to improve and enlarge the town-hall, police-courts, public offices, and markets. The Bill also contains clauses empowering the corporation to make extensive street improvements. The Margate Improvement Bill, which also contains clauses for the extension of the borough, seeks greatly enlarged powers as to building and other sanitary arrangements. Power is likewise sought for the widening and reconstruction of a large number of streets in the town, and there are clauses in the Bill enabling the corporation to enlarge and improve the existing town-hall, or to pull it down and build a new one. Further clauses enable the corporation to erect dwellings for the labouring classes who may be displaced by the works authorised by the Bill. The Bolton Corporation also promote an Improvement Bill, which provides for the extension of the limits of the borough, the construction of new roads and streets, new sewage works, and a new cemetery.

**Concrete.**—At the suggestion of Lord Elcho, M.P., a committee has been appointed by the Royal Institute of British Architects, with the view of reporting on the subject of "Concrete as a Fire-resisting Material," to a Select Committee of the House of Commons. The committee are now seeking information.

#### RESTORATIONS AT THE DULWICH PICTURE GALLERY.

For some months past the picture-gallery at Dulwich College has been closed, for the purpose of the building undergoing a complete renovation and mural decoration, and pending the execution of the works the pictures have been temporarily removed for exhibition at the Bethnal-green Museum. The roof and ceiling has been restored, and a new system of warming and ventilating the interior has been introduced. Hot-water pipes have been substituted for hot air, the new apparatus having been supplied and fitted on Haden's patent. The upper portions of the walls have been painted in a light warm tint, and the lower parts will be in red, the effect being heightened by gilt mouldings. This portion of the work is now in progress, and will be completed in the course of a week or two, but it is stated that the gallery will not be reopened until the spring of next year, the pictures in the meantime remaining at Bethnal-green. Mr. Mitchell, builder and decorator, of Dulwich, has executed the work, which has been carried out under the superintendence of Mr. Charles Barry, the architect to the college estate.

#### BIRMINGHAM ARCADE. ZINC GAS-FITTINGS.

THE accompanying engraving illustrates the centre dome and circular vestibule of the great arcade recently built in Birmingham, some descriptive particulars of which appeared in our issue of the 2nd of September.\*

Birmingham is the manufacturing centre of the gas-fitting trade, and from amongst a number of competitors Messrs. Best & Lloyd (of Cambray Works, Handsworth, and Holborn Viaduct, London) were the firm selected to light this extensive and popular structure; and having successfully introduced their innovation, the employment of zinc, in the manufacture of large and massive gas-fittings requisite to light up efficiently so considerable a range of building, we think it due to the ability and enterprise of the firm to notice the facilities afforded by them for providing large buildings with gas-fittings of suitably massive proportions and distinctness of detail, without incurring the heavy and often prohibitive cost of cast brass fittings, or sacrificing utilitarian necessities. If the appearance of these new zinc gas fittings were stamped by a manifest inferiority, their use in the lighting of even large buildings, where iron is often employed, would be much more limited than we venture to predict will be the case; but the mode adopted by Messrs. Best & Lloyd in the treatment of the baser metal, and in carrying a sound brass gas-way through whatever designs or shapes are given by the expensive metal-moulds employed in the production, and the good appearance imparted by the firm's antique bronze, justify the expectation that the small fittings (one-third or one-fourth the price of corresponding brass goods) will become very general in private dwellings.

We learn that their productions have been used at the Masonic banqueting-hall in Birmingham, the Arcade in Edinburgh, and the new municipal buildings in Kidderminster; and that they can hold their own against foreign competitors is shown by the fact that their fittings are used at the Houses of Parliament at Berne, the town-hall at Breslau, and Adelsberg Castle, Hanover.

#### MESSRS. DOULTON'S PREMISES, LAMBETH.

IN our present issue we give a view of the block of offices and studios now being erected at the corner of High-street, Lambeth, by Messrs. Doulton & Co., from the designs of Messrs. Tarring, Son, & Wilkinson, architects, the building which led to the strike of bricklayers, concerning which much has been said.

The building is designed to form the angle of the plot of ground occupied by Messrs. Doulton's warehouse and pottery works, and\* it will be a conspicuous object from the Albert Embankment. It is not much advanced beyond the ground-floor at present. When completed it will be very lofty. The materials are chiefly red brick and terra-cotta, but black brick is also extensively introduced, the whole of the lower plinth and base being of the latter material, which, being highly vitrified, is calculated to resist the wear

and tear of passing traffic better than ordinary brickwork.

Messrs. Doulton have of late years introduced and brought to great perfection the manufacture of a stoneware now generally known as "Doulton ware." This, as affording an indestructible medium for the introduction of coloured and artistic work, has been used by the architects for the decoration of reveals, cills, and panels, and as bosses. Terra-cotta blocks are prepared with sinkings and half-round hollows, which are keyed to hold the Doulton-ware tiles, rolls, or bosses, set in cement. The care which, with the aid of the pupils of the South Lambeth School of Art, under the supervision of Mr. John Sparkes, Messrs. Doulton give to the art-decoration of this special ware, renders it of value for use in the decorative parts of architectural works.

The work already laid by the special terra-cotta setters (the so-called plasterers of the bricklayers' strike) appears to be well done, and will go far to give an impetus to the extended use of terra-cotta, against which the chief complaint has been the irregular look of the joints and the winding of the terra-cotta.

It has been the care of the architects to design the terra-cotta details so as to show that these objections are capable of being removed, the latter one being obviated, in a great measure, by the use of incised ornament on the plain blocks, and by a careful arrangement of the break-joints, the whole of which have been arranged by them on large-scale drawings, in addition to the full-sized mouldings.

The building is arranged with a basement for stores. A ground-floor, with a highly-enriched triangular porch with doors right and left gives entrance to the offices. A spacious stone staircase at the back gives access to the first floor, which will be used as a show-room, and to the second, third, and fourth floors, which will be used as studios by the artists employed in the production of the Doulton and other ware. The entrance for the latter will be for the present a temporary one at the side of the building shown in perspective.

On the studio floors the depth of the window reveals will be used as flower-beds, in terra cotta and stoneware sides and fronts, for useful designing ornaments. The fourth floor opens on to a balcony on each elevation, which can be used for drying or other purposes.

The roof ridge is in the form of a T, the hips and valleys resting on the recessed walls of the balcony level, which are carried internally on the lower floors by terra-cotta columns and arches. The fourth-floor binders also form ties to some of the principals, and hip and valley pieces.

The roof will be covered with tiles of a subdued reddish-brown hue.

The terra cotta will be both red and cream colour. The oriel, which forms a feature over the entrance-door, is carried on an enriched terra-cotta corbel, tied to the cross wall and internal pier with L and T irons.

The name and coloured tiles forming a band round the turret will be in faience tiles set in cement, and keyed to the brickwork backing. The floors will be laid on joists wrought and chamfered on the lower edge, having fillets and wrought boarding between them, to form the ceiling of the room below, and to take pugging between the floor and ceiling boards.

Messrs. Doulton are carrying out the works themselves, with Mr. John Phillips as their manager.

We hear with great regret that Messrs. Doulton's works here and on the embankment, where the strike really occurred, are still "picketed," and that, as a result, very slow progress is being made. What is going on is so like a conspiracy in restraint of trade that it would probably go hard with those concerned in it if law were appealed to. The public and individuals are alike damaged by it; and with what object? To prevent two fellow-workmen who have obtained skill in the performance of a special branch of business from peacefully pursuing their calling, and earning their bread by the exercise of that skill, a right which it is thought the laws of the country secure to every man. The more carefully this strike is considered the more preposterous, the more suicidal, and the more deplorable does it appear.

**The Curfew at Stratford-on-Avon.**—The bell-tower of the Church of the Holy Cross, Stratford-on-Avon, has been put into repair in order that the ringing of the curfew-bell may be resumed.

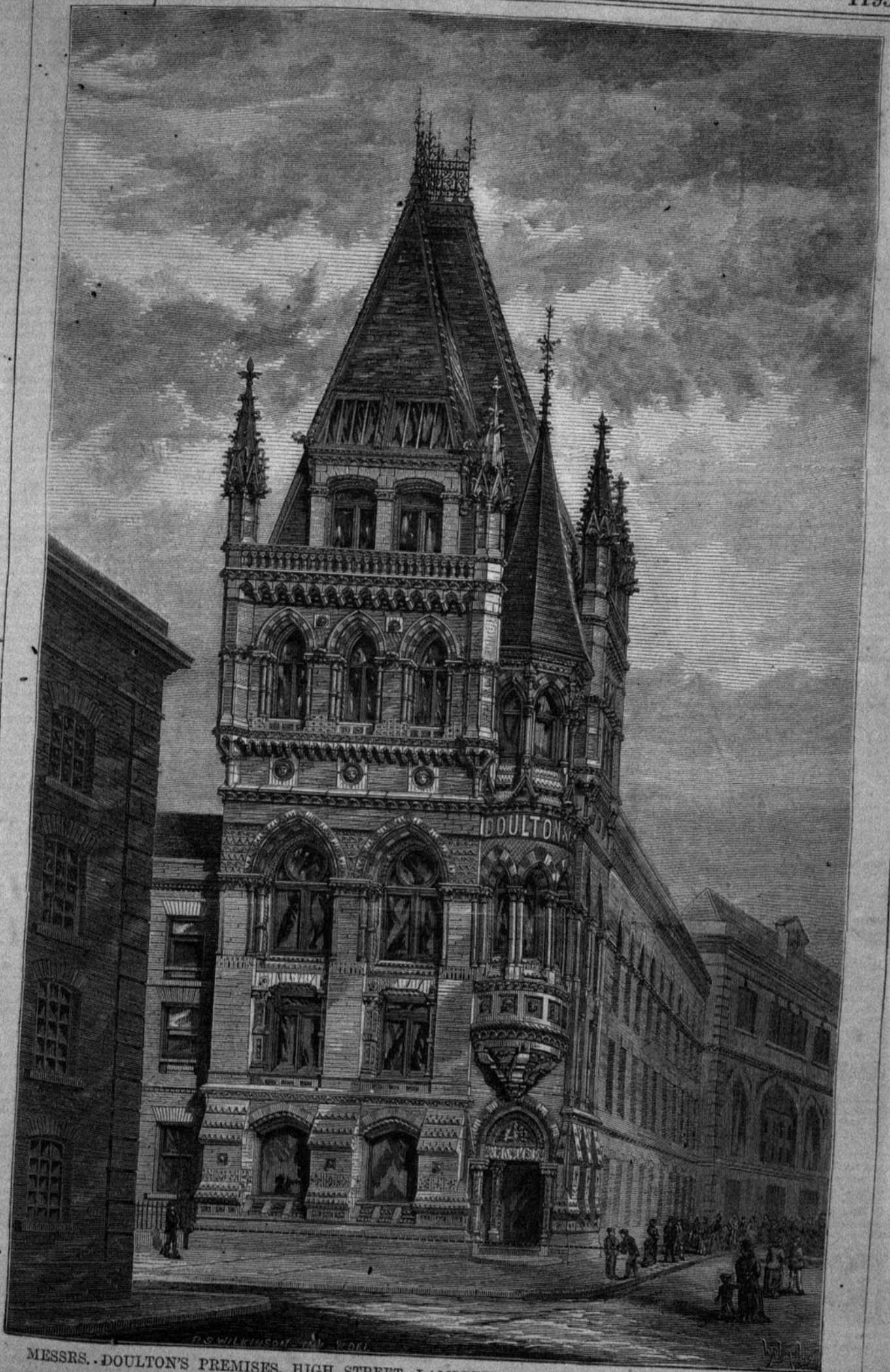
\* See p. 982, ante.





BIRMINGHAM ARCADE.—ZINC GAS FITTINGS.





MESSRS. DOULTON'S PREMISES, HIGH STREET, LAMBETH. INTRODUCING TERRA-COTTA AND STONEWARE.  
MESSRS. TARRING, SON, & WILKINSON, ARCHITECTS.



## A FRENCH VIEW OF COMPETITION.

MR. CHARLES BARRY'S exceedingly interesting address at the opening of the Royal Institute of British Architects has been read in Paris by French architects with some little wonder. It breathes a tone of discontent with the position of architecture, and its followers in England, that Frenchmen find difficult to appreciate.

Mr. Barry's remarks on the subject of competition do not agree with the opinion of an eminent architect here, as will be seen by the discourse of M. Jobbé-Duval, who at one of the conferences of the *Société Nationale des Architectes de France* spoke on the subject of competition very much to the following effect.

M. Jobbé-Duval thought that few people in the present day could openly declare themselves enemies to competition; he suggests that as we all allow that competition is good at the commencement of life, shackled by all the theories of the schools, how much more desirable must competition be to bring forth the result of an experience of many years?

Work, M. Jobbé-Duval truly observes, is a great moraliser, and can there be anything more efficacious in inciting artists to do their best than is afforded by a wholesome competition? And these pacific struggles, do they not induce the artists to higher aims than they are likely to be led up to by any successes which may come to them through their claims by established position or the help of friends?

According to M. Jobbé-Duval, three things are essential to ensure a successful result from competition: clearness of the programme; the equitable composition of the jury; its responsibility.

The programme ought to define clearly the limits of the ground; its topographical situation; the aspect of the principal façade; the precise details of the interior arrangements; the nature of the materials furnished by the country in which the building is to be erected; lastly, the cost. The programme ought, according to M. Jobbé-Duval, to abstain from all dictation as to style, in order that the artist, synthesising his knowledge, shall exercise all the liberty desirable in the creation of his work. It is this liberty which alone will allow of the creation of works bearing the particular stamp of each individual, and which will create an art suitable to the epoch in which we live. In these conditions, it would seem to M. Jobbé-Duval that the programme would satisfy both contracting parties, in determining the services demanded, and leaving all liberty to realise for the best the interests of art.

In approaching the second indispensable, the equitable composition of the jury, M. Jobbé-Duval remarks that here he is touching on the most delicate point of the question, and he attributes the failure of the jury, which so often happens, to the fact that a large proportion of the jurors, owing to their being selected on account of their eminence, are opponents of the system of competition, and therefore, as human agents, do everything to avert, unconsciously of course, the just operation of the system.

In passing to the third point, the responsibility of the jury, he remarks that a great injury is done to the competitors in the judgment they undergo without being able to defend themselves. Thus, men have passed months in thinking, combining, and executing an intellectual work, and all this is to be annulled without their being able to reply to the objections raised. In this there is an absolute perversion of justice.

I believe, says M. Jobbé-Duval, that the jury should not be too large, in order that each member should represent an independent individuality. A jury composed of ten members presents every guarantee necessary.

The discourse was ended by a warm appeal to the profession to support his views on the subject of competition.

Paris.

## Royal Military Academy, Woolwich.

Some important alterations are about to be carried out at the Royal Military Academy, Woolwich. The want of sufficient accommodation has been pointed out from time to time by the board of visitors, and works for increasing the accommodation for the cadets have been commenced, involving an expenditure of 20,000*l.*, of which a fourth has already been granted by Parliament. The governor's house is also being re-constructed at a cost of 3,800*l.* A sum of 3,600*l.* has been expended in enlarging the space for cricket and other outdoor sports.

## HOW TO DRAIN A HOUSE.

BY T. MELLARD READE, C.E.\*

THE subject of my paper is not one to excite the imagination, to give scope to lofty ideas, or to raise emotions of the sublime and beautiful. It is essentially of the earth earthy. To what extent the great masters of our art had to descend to consider so humble a subject as house drainage, I have not seen recorded in our text-books. Whether this has had anything to do with the grudging attention usually paid to house drainage by the profession I am not aware. Admittedly it is an unentertaining subject and not one calculated to excite the interest of the artistic mind, fed on the exciting but not very nourishing food of the competition perspective.

The architect, as a rule, not taking any special interest in this class of work, usually as regards the carrying out of his plans relegates it largely to the clerk of works, or, if there be none, leaves it in the hands of the bricklayer, who hands it over to a labourer, and as clerks of works are not always paragons of knowledge and accuracy, and bricklayers are not the most scientific of men,—even though as honest as the one to whom Professor Huxley would entrust the planning of a college in preference to engaging the services of an "eminent architect,"—the drainage works are, to speak in the mildest terms, frequently unsatisfactory.

But, as is often the case, that which at first repels us becomes interesting on closer study, and with the view of promoting a more exact and scientific way of carrying out the drainage of a house, I have ventured to submit to your consideration the following practical observations on "How to Drain a House."

With the introduction of the complex arrangements of the modern house,—complex, at all events, as compared with that which satisfied our forefathers,—but more especially as the natural complement of an abundant water supply delivered to each individual house, the modern system of sewerage became a necessity. It is not my present purpose to deal with the "sewer,"—that is, the duct in the street provided by the sanitary authority which usually, and especially in towns, performs the separate functions of a drain for surface-water and a duct for "sewage." For my present purpose I assume, in my first example, that it exists, and, in my second example, that our supposed building is away from the modern luxury of a sewerage system, in which the disposal of the sewage itself becomes one of the main considerations, and is of primary importance.

Before treating of the general principles to be followed in house-drainage, I may remark that in the selection of the materials of our drains there is not now much choice. The use of glazed fire-clay or earthenware pipes is almost universal. Cement pipes have been recommended by an eminent authority, but as I have had no experience of them it is not necessary for me to do more than mention them. No one would now propose to use brick or stone culverts, or drains square in section, with sides of brick, and bottom of slates, as were formerly in vogue. Practically, then, our choice of materials is limited, but as usual there are great variations in the quality of the article supplied, not only by different, but by the same manufacturers. What the architect should insist upon is a strong, well-burned, material, accuracy in form, both sectionally and longitudinally, true sockets, and a good smooth glaze. The smaller pipes are especially liable to be twisted longitudinally, and such should be at once rejected. Pipes having a rough interior should not be used, as lumps and blisters in the glaze accumulate material round them and injure the efficiency of the drain.

At the risk of being accused of putting the cart before the horse, I will also explain the practical art of laying drain-pipes and the fall it is necessary to give them before touching upon the general question of how to design house-drainage. I do this because I consider the proper laying of the pipes one of the most important parts of drainage, and the one in which failures most often occur, and without which any system of house-drainage will not perform its functions satisfactorily. The true laying of a pipe is of more importance than its quality. An inferior rough, and crooked pipe may if laid properly under ordinary circumstances be made to perform its work satisfactorily, whereas the best

made pipe, in the world will only act for a time, and then inefficiently, if laid in those beautiful vertical and horizontal sweeps known as Hogarth's line of beauty, so frequently seen only in their full perfection when a drain is taken up.

The righteous indignation of the bricklayer and his labourers employed in taking it up, against the tradesman who laid it down, is only fully appreciated when, on having to take the drain up a second time, we find these honest men have put in a pipe without a socket, or a square junction, or a junction turned the wrong way, or accidentally omitted to make a joint good, or done or left undone some one of those multitudinous things essential to good workmanship. Truly the architect's bed is one more of thorns than roses.

The next thing, to be determined upon is the fall, and I cannot too strongly insist upon the necessity, in all cases, of having the levels first accurately taken and a section made before the drains are put in. This is an additional trouble, no doubt, but will be amply repaid in the quality of the work. Of course, when the whole of the trenches can be opened at once, this is not always necessary; but it more often happens that the trench has to be filled up as the work proceeds, either from the nature of the ground or the exigencies of the site. The architect should, of course, aim at getting the greatest amount of fall from the sewer to the junction, with the branch drains of the house, keeping in view that these should themselves have quicker gradients than the main drain. Without a section it is generally difficult to do this. A fall of 1 in 48, or half an inch to a pipe, is a good one for a main drain; but it sometimes happens that this cannot be obtained. Nay, I have myself had to lay them nearly level; but in such cases special flushing arrangements are absolutely necessary. The usual system pursued by the "honest bricklayer" is to start from the main sewer and lay each pipe to a fall by a straight-edge with a piece of wood planted on one end. The size of this piece is determined by some rule no doubt,—probably the rule of thumb; a rule, I need scarcely say, of very wide and universal application. By means of these implements the drain gradually rises towards the house; but whether it hits the exact level or falls below it, or is a foot or two higher, Providence alone can determine; at all events, I may say it is not so certain to work out right as were the two driftways through Mount Cenis. It not seldom happens that if the workman finds he has made a bungle and got too high, he either carries his drain on a level, or actually dips it the wrong way. And what does the architect do? He sees the end of the pipe at the proper level, and all the rest carefully covered up, and probably assumes that all is right.

There is another internal defect arising from this way of laying pipes; they are laid by the flanges, and the inverts, which are of primary importance, are left to take care of themselves. I have never seen outside of my own practice house-drains laid by their inverts; but I consider this should, where the fall is limited, always be done. It is readily done, but the drain-layer has to be taught, and it is a good deal of trouble to teach him, but not more than, I hope, any architect interested in the perfection of his work would undertake. The method of proceeding is by fixing sight-rails at the two ends of the drain, and sighting a boning-rod with a T-piece at the top, and a bent piece of iron or shoe to fit on to the invert at the bottom. This, of course, usually involves a correct system of levels and bench-marks, with the depths figured on the drawing. The joints should in all cases be made in cement; half Portland cement and half sand is a good proportion; and special care should be taken to scrape out the cement on the inside of the joint, so as to leave as perfect a tube as possible, free from lumps and obstructions. I need scarcely say half-bricks should not be left in the pipes, but I have not unfrequently found them there.

Having now described some of the more important structural details necessary to the efficient action of any system of drainage, I shall next discuss the best system to be adopted.

It is pretty generally admitted that all drains should be on the outside of a house, and in no cases, except through unavoidable necessity, should they be carried through it.

The soil and waste-pipes from water-closets, baths, and lavatories, should also be taken as far as possible outside. I assume, in the first place, that every sink, basin, and bath is trapped in-

\* Read before the Liverpool Architectural Society, November 29th.



side the house with an S trap, constructed so as to be readily cleaned. If this is not done, draughts of air will come up them into the room, conveying the stench from the organic matters coating the interior surface of the pipe, even though the sewer gases should be carefully excluded by external arrangements such as I shall presently describe. The water-closet is always fitted with an S trap, which should not exceed 4 in. diameter, though the soil-pipe into which it empties is better larger, and I frequently specify it 5 in. I consider the pan-closet objectionable, especially since the compulsory introduction of the two-gallon regulating cistern has increased the difficulty of getting the after-flush to fill the pan. The container is a reservoir coated with filth, hidden by the pan holding the water in the basin. A basin with a trap at the side or back, called a wash-out basin, is a far better apparatus. If a pan-closet is used, it should always have the container ventilated. Baths and lavatory basins should never have their outlets into the soil-pipe of the closet: this is often done to save expense, and even the trap of the closet is used to trap the waste-pipe from basins and baths; but this is still more objectionable. The soil-pipe of a closet should in all cases be an independent pipe, into which nothing but the soil enters, and it should be carried up above the eaves of the house, full bore; if to the top of a chimney-stack all the better, and it should be, except in those cases where it acts also to take the gutter-water from the roof, fitted with a wind-guard or revolving cowl to prevent down-draughts.

We now come to the drainage proper by which all the separate outflows of waste organic matter are to be carried off and into the main sewer.

In designing a system of house-drainage we must decide, in the first place, whether we keep our rainwater separate. In the case of a house supplied with hard water it is advisable to store the rainwater, and this is best done, as is usual, in an underground brick tank cemented inside, called a *terras cistern*. It will nearly always be found that there are some down-spouts that, through the levels, cannot be readily connected with this cistern. These should be turned into the drain, which they will help to flush and keep clean. In cases, however, where the sewage has to be disposed of independently of a main sewer, the rainwater is rather a trouble than otherwise, and those pipes unconnected with the rainwater cistern should be turned on to the surface channels or made to flow over a grass plot. The overflow of the *terras cisterns* should in no case, where it is possible to avoid it, be in any way connected with the drain; if it is we can never be sure of the purity of the water, and I have known instances where the whole of the house has been connected with the sewer through the rainwater cistern; the air-space above the cistern being connected with the space under the floor of the house, the overflow being taken into the sewer and untrapped. Even if trapped we have no security, as the water in the trap dries up before the cistern overflows again. On the other hand, if the overflow be taken into an air-chambered trap supplied with water from another source, there is always the possibility of the trap choking through inattention and the sewage water backing into the tank. The overflow should be taken into an absorbent well, or discharged on the surface of the ground, which, if the levels allow it, is still better.

In some cases the sewage from the baths, basins, and sinks is carried independently into a tank from which it is pumped to be used for garden purposes. The soil alone of the water-closets is taken into the main-sewer. This is an arrangement also suitable for a house supplied with earth-closets, and one I am adopting at the New Truant Schools at Hightown. Where there is a man employed constantly who can look after the tank, and keep it empty, or plenty of labour in the shape of boys to pump it dry every day, the arrangement is a good one, and combined with the earth-closet in such cases, with land on which to use it, the main-sewer can be dispensed with altogether. In all cases where it is possible the sewage should be used before decomposition sets in. In those special instances, and these constitute a large class of cases, where there is no main sewerage, and there is not labour to keep the tank pumped frequently, other methods must be adopted. The ordinary cesspool is an abomination, containing as it does a festering and decomposing mass of filthy matter which is not removed until it attains the consistency of a solid pulp. This is the absorbent well. If such a thing has to be adopted, it should be well ventilated, and the connexion of the house-drains

with it effectually cut off. I am, however, trying another system, which, if it succeeds, I shall be happy to explain at a future time.

Let me describe the drainage of a large villa as recently carried out by me. The sewage or slop-tank is placed in a convenient position in the kitchen garden, and the levels so arranged that the inlet drain discharges into it above the level of the garden surface. I consider this a matter of great importance, for by doing so I get an overflow on to the surface, and it is impossible for the sewage to back up the pipe and seal the end of it to the atmosphere. I have known this purposely done, and indeed have in former times dipped the end of the pipe below the surface of the water with the mistaken view of "trapping it," but find by experience it is an entire mistake, as the first thing to be considered after providing for the flow of the water is to arrange for the circulation of the air. By no other means can we ensure the drains being kept sweet. The tank is constructed of brick in cement, vaulted over with an arch in which is an iron manhole cover; it is in no way an absorbent well, and the whole of the sewage must consequently be pumped out and disposed of on the surface or by the overflow. By such means the organic matters get oxydised in percolating through the pores of the earth, whereas in the case of an absorbent well such oxydiation does not take place, but all the surrounding subsoil becomes sewage sodden as the atmosphere is permanently excluded. From the tank a drain is laid on a bank at an inclination of 1 in 80 and 1 in 16, gradually increasing as it approaches the house. This drain should always do. There is a manhole containing at the bottom one of Pott's air-chambered traps which I will presently describe. This effectually severs the connexion between the tank and the house, as all the slop-drains converge at this point. From the tank side of the S trap is carried a 4-in. ventilating pipe to the upright ventilator, which consists of a 5-in. cast-iron pipe terminating on a chimney-stack, with a cowl carried up above the chimney-pots. This also acts as a ventilator for the soil drains, as I will presently show. The slops are drawn from three situations, terminating in two cases in Pott's traps, which sever the connexion between the house and the drains between it and the manhole. This completes the slop drainage.

The soil-drain commences at the main sewer in the road with a 9-in. pipe, at an inclination of 1 in 10, 1 in 53, and 1 in 12. At the point where the branch drains converge is a manhole, and at the bottom is a 6-in. S trap built up solid in the brickwork. This trap occupies half of the manhole, the other half is an open duct, and as the drain is 9 in. on the other side this open duct converges. The bottom of the duct is of glazed brick, and is laid at a greater inclination than the sewer. The manhole is contracted towards the surface, and fitted with a cast-iron manhole cover and a side ventilator. It will thus be seen that all communication between the main sewer and the house is effectually prevented. Further on the drain diminishes to 6 in., and is connected with the vertical ventilating pipe by a 4-in. branch; it is then carried on to the waterclosets, as shown. The soil-pipe is carried up as a ventilator, and terminated with a cowl. Along the course of the drain are apertures for putting the garden-hose in for flushing it above the flushing-tank. There is a flushing-tank supplied with water from the main. It is of brick in cement, and is fitted with one of Doulton's valves. Occasionally the tank is filled with water by a tap from the main, the valve drawn up, and the hydraulic force developed is sufficient to clean out the drain. Had there been a convenient spot for it I should have placed the flushing-tank at the head of the drain. I have used these tanks for a good many years, and with most beneficial effect. As a rule, the amount of water running down a house-drain is insufficient to keep it clean, and frequently have I had to take up drains filled up solid with deposit, which, if they had been capable of being flushed out in the way named, might have been kept perfectly clear. By the combination of manholes and traps in every case I get a through current of air in the main drains.

The inlet is open, and the outlet is in one of the two ventilating shafts. This keeps the drain perfectly sweet. The house is entirely isolated from external influence, and the drains instead of being filled with fecal matters are kept clean and free. The division of the slops and soil where there is main sewerage, is, of course, not by any means absolutely necessary, but is a refinement I should only recommend in a large

house, where the slops are valuable in the garden, and where there is labour to dispose of them. The slops might be taken into the main sewer, the house being isolated therefrom just the same.

The manhole, with its contained trap, is a novel feature of great utility; by it, the drain can be inspected, and if the trap should get accidentally choked, such a calamity is found out and obviated at once; whereas, otherwise, the first notice of it in many cases may be the backing up of the sewage into the foundations. It is an inspection place, which no system of drainage should be without, as, otherwise, it is impossible to say whether the drains are working properly or not.

Formerly, trapping a drain meant bottling up the gases in it, now it is recognised that no system of trapping is perfect without ventilation combined with it. There are many patterns of traps for effecting this, besides those I have used here, but I have not space to describe them.

To conclude, there is no part of the house which more wants supervision than the drainage, and no part that is more difficult to supervise. Speaking to architects, I may say that 5 per cent. commission will not pay for the necessary labour. I never expect it to do so; but, as it is part of the whole, I think, it being so necessary to health, that attention should be paid to it all the same. I picture to myself the happy time when 7½ per cent. commission will enable an architect, without robbing himself, to do full justice to his client; but, I fear, at present, it is only a pleasing fiction of the imagination not soon to be realised. Admittedly the system of contract competition now in vogue, and its consequent demands on one's time, through having to specify every nail and screw, to foresee everything, and to provide for everything, is a great and increasing tax upon the mental resources of architects. Perhaps my little contribution may assist some in this difficult profession; at all events, practical description is of the utmost value to those who desire to learn, and I trust my remarks may be useful to them, if not to those who have grown grey in the service.

#### ARCHÆOLOGY AND ARCHITECTURE.

SIR,—In your report of Mr. H. C. Boyes's paper, which you entitled "What Style Next?" p. 1099, there is a cursory allusion to the archaeological thralldom under which it may be said the profession is at present as a body labouring. As a young architect I feel that this subject is one which ought to be duly considered in its bearing upon the art training of the rising generation of architects. That the study of archæology is of great importance and assistance to the architect there cannot be a doubt, but if architecture is to assert its pre-eminence over other fine arts, archæology will have to be the pastime and not the serious business of its professors. It may appear somewhat paradoxical to assert that no event or circumstance that has occurred during modern times has been more derogatory to the true principles of architectural art than the archæological and antiquarian mania which has sprung up and developed itself since the revival of Gothic architecture by the elder Pugin and others.

During the whole period of architectural history there was a constant pouring out of fresh ideas, until the revival of letters in the sixteenth century, when a mighty retrogressive stride was taken extending over nearly 2,000 years, and forthwith the Classical styles were resuscitated and became universal throughout nearly the whole of Europe. This event, although in one sense an inestimable boon, yet, in another, was the greatest calamity that ever befel architecture before or since. At the same time that it opened up the vast treasures of art of bygone ages, it erected an obstacle to the advance of originality which architecture has never since been able to surmount.

Since the sixteenth century, architects have been busily engaged repeating the architectural history of the previous 2,000 years, and yet we have scarcely worked up to our own times again, but continue to linger with reverential awe around the fascinating beauty of the so-called "Queen Anne" period.

All known styles, both of architecture and art have had their own peculiar characteristics. Why should not this be so now? Has nature been exhausted, or have the inventive capabilities of man already attained their zenith? The one great reason why architects of the



present day are unable to advance beyond what has already been accomplished by their predecessors is owing to the faulty system of education which prevails. Students are requested to reproduce the various outlines that are set before them; when, having attained a certain degree of perfection in copying they are permitted to fall back upon their own resources, and consequently either sink into oblivion, or, if they have that within them which can aspire to higher altitudes than mere freehand drawing, they may ultimately rise to eminence. But, alas! how few of those who are educated at our art-schools ever aspire beyond the endeavour to excel in mere mechanical manipulation?

The present age ought to eclipse all that has previously been done in the way of art-productions, seeing that perfection has well-nigh been attained in the manufacture of all those necessary implements with which the artist performs his purely mechanical labours. That, however, which cannot be purchased, but which is nevertheless the one grand quality essentially necessary to be possessed by an artist, i.e., the power of idealisation, is a gift bestowed only on a very limited number of art-students. The development of this power of idealism is probably in no case so much ignored as in the training of an architectural pupil. On entering an architect's office, where he is supposed to be initiated into the mysteries of his profession, his first lesson is usually to copy the Roman mouldings, capitals, &c., after which he will, in all probability make an elevation of a Grecian temple in the Doric style. He will now be quickly pushed forward through a course of Early English mouldings and traceried windows, canopies, crockets, and finials, after which he will make copies of designs carried out by his principal, which in many cases are themselves little more than plagiarisms. A little professional advice will probably be given him with reference to the desirability of copying old work upon every occasion that may present itself. The stock occupation of an architectural pupil consists mainly in tracing. The whole system of education, as far as he is concerned, is one of copyism from the beginning to the end of his pupilage. To copy becomes in this case "second nature," and it rarely happens that he is incited by his superior to original efforts. The natural result of such a system of training being that instead of producing architects, we have only excellent manipulative draughtsmen.

The whole office education of the architectural student tends to smother originality and damp any spark of idealism that may be endeavouring to develop itself. Another of the evils of the present system arises from the class of critics it necessarily produces. A critic cramfull of archaeology will censure all that is not archaeologically correct, and by so doing disheartens many a rising and would-be genius. A young architect who attempts to introduce new and novel features into his design is not credited with being original in his ideas, but is invariably snubbed for what is too commonly regarded as ignorance of the correct archaeological peculiarities of the style in which he essays to work. The fear of adverse criticism has prevented our leading architects from introducing reforms which they have themselves suggested; it is, therefore, not surprising to find considerable diffidence in younger members of the profession. As an instance of this, I may mention that Sir G. G. Scott in one of his works says that if he were using the Classical orders he should substitute natural foliage for the acanthus and other conventional leaves in use by the ancients. Since writing in that strain he has had a magnificent opportunity for carrying out such a bold reform, the like of which was probably never before contemplated. A glance at the new Foreign Offices will at once decide whether he has had the courage to defy precedent.

The battle of "styles," which has been raging for some time, I regard as derogatory to the dignity of art. There is a lack of unanimity amongst members of the profession which renders it next to impossible for a definite mode of action to be pursued or a particular train of thought systematically worked out, and so develop a new school of architecture. The very fact of a man proclaiming himself a Gothiciist or a Classicist displays on his part a lack of originality. It is tantamount to saying, "I work like Wren," "I work like Scott." It is this professor of a particular "style" or phrase of art that is the greatest enemy to the encouragement of originality. The man who permits himself to be fettered by "modules" and "minutes" cannot

be expected to soar into the realms of fancy and imagery.

Every architect should have, and at the same time practise, a style of his own, for individual mannerism is far preferable to servile copyism. Another evil which is engendered by this archaeological mania is the agitation of "style" which results, and the consequent division of opinion in the architectural camp. Between these varied and opposing currents of thought the architectural student has to decide, and he either takes sides unthinkingly, or his art ideas are so confused as to become a perfect chaos.

That the subjects of form, colour, and proportion will ever remain matters of individual opinion there cannot be a doubt, but it is, nevertheless, not a little discouraging to the seeker after truth on discovering that the fundamental principles of art after the lapse of centuries still remain subjects for diverse opinions and continual controversy. John Ruskin and Alexander Thomson are both names which cannot be but honoured by all architectural students, yet the opinions of these two men are diametrically opposed; for that which the former decries as "barbarous," the latter as emphatically pronounces "true and beautiful." If greater attention were given to the principles involved in art rather than to the mere forms of art, more originality would, I am convinced, be the result. Sir Joshua Reynolds, in one of his discourses, says "the more extensive your acquaintance is with the works of those who have excelled, the more extensive will be your powers of invention, and what may appear still more like a paradox, the more original will be your conceptions." Some such similar arguments have been advanced in favour of archaeological research and the desirability of making it the groundwork of architectural study. I venture to think, however, that the idea intended to be conveyed in the foregoing quotation is not that it is imperatively necessary that an artist be crammed with the conceptions of others before he is competent to display any originality; but that a larger acquaintance with the works of our predecessors enables us, by means of this more extended field of comparison, to discover whether our ideas assimilate with those of previous workers, or whether, on the other hand, they are so far distinct as to be deemed original. Dr. Samuel Johnson conceived it possible for the mind to be so overloaded with the ideas of others that, oppressed with such a weight of knowledge, it becomes incapable of exercising any originality, and can only reproduce that which it has already received from others, and even that only indifferently, unless fired by the same enthusiasm as the original authors.

So that we cannot but admit that a too fervent devotion to the shrine of archaeology is attended with much that is detrimental to the interests of true art. If the leading principles of art were instilled into the minds of architectural students prior to their ideas being mystified and confused by a conglomeration of forms and arbitrary outlines, greater hopes might be entertained as to the possibility of every architect having and working in his own style, and thus founding schools of architecture analogous to the various schools of painting. Why not send the art-student direct to the fountain-head for inspiration,—the source from whence our predecessors obtained their inspiration,—instead of setting him to make a copy of a copy? There is no other profession where a state of affairs is to be found analogous to that which we find to exist amongst architects as a body, and which, unless a grand revolution be effected in the system of official pupilage, will continue to exist, and the despairing cry of the architectural student will ever be,—“Copy and copy again!”

JAMES G. BUCKLE.

#### ARCHITECTURAL ASSOCIATION.

At the ordinary general meeting of this Association, held on the 27th ult., Mr. W. W. Robertson, vice-president, in the chair, the following new members were elected, viz.,—Messrs. M. Clarke, F. Ward, J. R. Withers, Vincent C. Brown, G. Tournier, E. J. Instone, W. S. R. Payne, E. W. Millwood, S. G. Parr, E. G. Fuller, G. G. Stanham, J. W. Ringrose, T. M. Steers, E. Gabriel, F. J. Mew, S. M. Herapath, W. W. Neve, E. H. Edwards, C. W. Reves, J. Smith, W. J. Barrows, H. Druery, jun., and G. L. Wood. Mr. A. Frere then read a paper on "Binocular Perspective and Natural Drawing," after which a short discussion, somewhat opposed to the author's views, followed.

#### HOUSE DRAINAGE.

At the Society of Arts on Wednesday, November 29th, Mr. R. Rawlinson, C.B., in the chair, the paper read was on the subject of "House Drainage," by Major General F. C. Cotton, C.S.I. It is no disparagement of the paper to say that it contained very little our readers have not seen already. In the course of the discussion which followed:—

Mr. Baldwin Latham said the engineer might bestow the greatest pains, probably, in carrying out the most perfect system of town sewerage, and yet, if the work connected with the drainage of private houses was not undertaken with some skill and attention, the whole system must prove a failure. The strength of a chain was tested by its weakest link; and the weak link in its system of sewerage was the private house drain. If persons only knew the absolute importance of paying personal attention to this they would not, he was sure, sit easy by their firesides, thinking of those malarious gases which might be escaping from the basements, and permeating their habitations to the permanent injury of themselves and their children. It was almost impossible to mention all the matters necessary with regard to this question, but there was one thing which only recently came under his attention in connexion with one of the largest houses at Queen's-gate, where there were seven housemaids' closets one over another. There was a 2½-in. lead pipe communicating with the whole of them, and ventilated at the top. He had found that a pail of water thrown down at the top untrapped every one of the traps below. This showed the absolute necessity of not laying down any general rule with regard to a simple ventilating pipe. The effect of the pail of water was to induce a current of air,—in fact, it acted like the piston of a pump, and drew out the air from the pipe, and so sucked out the water from the adjoining trap. The only way of getting security in this case was by putting in a second pipe alongside the other, and carrying it independently to a point above the highest sink. There could be no doubt that one of the greatest evils with regard to the laying of drain-pipes was the use of clay at the joints. Apart from the qualities of the material itself, it must be recollected that if you took two ordinary spigot and socket pipes, and filled the joint with a fillet of clay, and put the spigot into the end of it, they did not fit tightly, because there was room for the clay, and considerable play, and the moment the filling was put in at the top, the weight of it forced out the clay at the bottom, and left an aperture above, through which the sewage flowed into the sub-soil, and thus the basement of the house soon became filled with sewer gas. Some of the best houses in the West End were the worst drained. In many cottages the sanitary authorities looked after them, but the large houses nobody except those living in them was interested in looking after. He had seen a house where a royal Prince lived, and in which two Cabinet ministers had previously died, where he found a cesspool at the foot of the staircase, and a brick sewer, running from one end of the house to the other, which had not even an apology for mortar in its joints, and there were only about 18 in. between it and the flagged basement. If such was the state of matters in a royal residence, what might be expected in other houses? With regard to covering the basement with concrete, he should like to draw attention to the lectures recently delivered at Munich by Professor Pettenkofer, in which he showed the enormous influence of aëration from the ground air, and stated that London would not be at all the healthy place it was if it were not for the fact that there were so many open basements between sewers and gas-pipes and the houses. This insensible ventilation went on with regard to every building, and he showed that the mud hut of the savage—where people were huddled together in a very crowded state—was comparatively healthy, because of this imperceptible ventilation which passed through the walls. The same thing took place with regard to the gipsies' tents. Then, with regard to concrete it was known to be extremely porous as a building material, and, therefore, it would allow of a remarkable degree of this imperceptible ventilation, even from the ground atmosphere, to pass into the house; and it might, therefore, be necessary, hereafter, in the construction of houses, to cover the concrete with asphalt, and provide proper means for admitting the external air; because, if you shut out the air at one point, there was a great stress at that place, unless you made provision to admit



air somewhere else. He could thoroughly endorse the saying that, in taking possession of a house, you should look to the drainage before you furnished the drawing-room.

Mr. Coneybeare said the importance of this subject could not be exaggerated, nor the great ignorance which existed upon it, both amongst builders and architects, as well as the general public. He had never lived in a house which was properly drained. There could be no doubt there ought to be one general system of drainage, and the sooner London was put under one management for the supply of air, water, and gas, the sooner they would be entitled to call England a civilised country. Sanitary arrangements, however, were equally wanting in country towns. He once slept in a house off the Cromwell-road, where he was terribly annoyed in the night by bad smells, and he found in the morning that all the other inmates had suffered in the same way; he should certainly have expected an attack of fever if he had remained there long. A very common evil was the use of the same cistern to supply drinking-water as served for the closets, and it would often be found that water left for any length of time in a jug would become exceedingly offensive.

Mr. Hale thought it would be well if the Society were to offer a prize for the best treatise on house-drainage, to be accompanied by models. He should like to hear some gentleman who professed to be well up in these matters get up and say that he lived in a house where the drainage was perfect, and describe the system for the benefit of the public. He also thought it would be a good thing if a company were started to build houses on sanitary principles.

The Chairman, in reply to a remark that there ought to be public functionaries appointed to certify to the soundness of house-drains, said the law, as it now stood, required the surveyor to see that there were proper plans laid before the Local Board, and it was also his duty to see that the drains were properly constructed. There could not be the excuse that he had not time, because it was the duty of the Local Board to furnish him with such assistance as was necessary. He was sure there were surveyors present who would give the meeting their experience, which would be much better than the speculative opinions of gentlemen who had not the opportunity of knowing what the law or the practice was.

Mr. T. Porter said his experience showed that these rules were not carried out, and he could instance hundreds of houses where, if such a law were enforced, bad drains could not exist, and yet where the drain-pipes were laid with butt-joints, and with no cement. If it was the duty of the local surveyor to certify that the houses were properly drained, how was it that, in nine cases out of ten, the drainage was so imperfect? It was true that plans were supposed to be deposited with the Local Board, but there was no guarantee whatever to the purchaser or lessee that the law had been carried out. A drawing was not sufficient; but if the surveyor had to sign it as a certificate that he had examined the drains, there would be some security to the public.

Mr. Greenstreet (surveyor to the St. Saviour's Board of Works) said he had patented a trap, which he believed would be found very useful and efficient. It was designed especially for street gullies, to meet the objections to the common block or D-trap, but would be also applicable to house-drains. He proposed to insert, about 9 in. beneath the grating, a piece of india-rubber, on a frame, in which there was a slit. When the wash from the road overcame the resistance of the india-rubber, it would give way, and allow the sewage to pass, and would then close again immediately.

Mr. Knight (surveyor to the Mile-end Vestry) was sorry to hear a number of architects denounced as being totally ignorant of house-drainage, and did not believe such was the case. No doubt, there were many cases of bad drainage, but they were mostly in old houses. In the district under his charge the practice was for either himself or his deputy to see the pipes of every house before they were covered up. He admitted that he had been guilty, like many others, of using clay for stopping the joints, but he now recommended the use of tow, coated with Portland cement, plugged in the same as in water-pipes. With regard to the india-rubber trap just mentioned, he saw it in use many years ago, but it was found that little bits of stick or straw got into it and kept it open.

Mr. Liggins said it was pretty well known

that the Society of Arts had appointed a committee to go into this question, and he could not imagine a more important one, and rejoiced that they had done so; but it was important that they should not make statements which would not bear investigation. Not many months ago a report appeared in the *Times* of a deputation headed by Sir Henry Cole waiting on the Metropolitan Board of Works, which was the sanitary authority for London. Mr. Coneybeare regretted that this Board had not the gas, water, and drainage of the metropolis under its control; but the latter was under its control, and able surveyors were appointed, who did look after the drainage as far as their powers went. Those powers, however, only extended to houses built since 1856, and the horrible state of things which had been discovered in Harley-street no doubt existed in many other places. But if the Board had power to reconstruct the drains of all old houses, he should like to ask the rate-payers how they would care to have enforced upon them the employment of such a large staff as would be necessary to carry out these sanitary arrangements. He thought something must be left to the common sense of individual householders, who would naturally have regard to the interest of their families, and see when they took a house that it was properly drained. Let each man, when he took a house, employ a surveyor, and see that it was properly drained; that was the plan he had adopted, and he had never had a case of sickness in his house in nineteen years.

Mr. Weaver (surveyor of Kensington) said he had not heard any practical suggestion made to get rid of the evils complained of, though there seemed to be a great deal of hidden talent; and if the suggestion were followed of offering a premium, perhaps it might develop some of this latent talent. He should be very pleased to give 20l. out of his own pocket to any one who would tell him how he could look after every joint in every pipe in the 800 houses which were built every year under his supervision. To take the case mentioned, of the seven-storied house at Queen's-gate, it would require a clerk of the works, at 3l. 3s. a week, constantly on the spot, to prevent the defects which had been mentioned, and you must multiply the sum by 600 to arrive at the cost of insuring perfect drainage. The plan they followed was to give printed directions to every builder in the parish for his guidance, and he believed that, in the majority of instances, the man's self-interest would prompt him to make his house saleable, by taking reasonable precautions. But while land was so highly valued that no gardens were possible, and closets had to be crammed almost into the middle of the room, they must put up with imperfections. He was quite sure the vestries would be only too happy to adopt any reasonable suggestion for securing perfect drainage.

The Chairman said he could not agree with some of the remarks of the last speaker. The rates in Kensington had recently been raised nearly one-third; and he was satisfied that the income of the vestry was competent, if necessary, to meet even the extravagant expenditure suggested without levying an additional rate, and it would be money well laid out if perfection in drainage was accomplished. Human life was the most valuable thing in this world, and, therefore, whatever was necessary to its security was not extravagant.

The discussion was continued on Wednesday, December 6th.

#### ART FOR THE POTTERS.

THE WEDGWOOD INSTITUTE, BURSLEM.

THE seventh annual meeting and distribution of prizes in connexion with the Burslem School of Science and Art was held on the 16th ult., when Mr. H. S. Marks delivered an interesting address. In the course of it he said:—"You have relations and friends who will gladly sit for you. The domestic cat is a capital subject for study. You may learn many a lesson in drawing the furniture of your homes,—the humble coal-scuttle foreshortened will puzzle some of you to draw correctly. You laugh, but I only wish to impress on you the fact that there is material for you to work on everywhere. Mr. Ruskin said very wisely—'The true artist thirsts to draw every thing.' This is equally applicable to the student, who should draw at all times, and in all places. In the special branch of art more particularly cultivated here (pottery), good drawing is as essential as in any other; though it cannot be the very finest that can be applied to other

forms, there is no reason why it should not be first-rate of its kind. The Italian plates of the Renaissance-period show unusual excellence in this respect, and great sureness of hand both in ornament and figure. Students who intend to decorate pottery might shade their preparatory studies with sepia instead of chalk as a means of familiarising their hand to the material they will use in their daily work. It is important, too, that they should learn to model broadly at first, and without surface finish, and I cannot help thinking it would do no harm if every student took a turn at 'throwing' that he might learn to make a pot before decorating it. It is quite possible that some of you may have a fine latent feeling for form which, encouraged in this way, might develop into producing for us new shapes of use and beauty. I understand the number of throwers is limited; that they work chiefly in a mechanical way; that there is no novelty in the moulds you employ since the time of Wedgwood. If so, this is not as it should be. We have surely men among us who can do something out of the beaten track. The importance of the study of flowers and plants for pottery cannot be too greatly insisted on, affording, as they ever have and will, such staple means for its decoration. Flower-painting is far more thoroughly taught in France and Germany than here, and the consequence is that we cannot compete with those nations. And this brings me to a delicate subject. Knowing the large amount of foreign talent occupied in these quarters, no one could more cordially recognise than I do the great abilities of MM. Solon, Mussill, Hürten, and of other foreign art-workers here. But their presence should stimulate you to friendly rivalry, and show that the English can do something too. It is not that I love the foreigner less, but that I love the Englishman more, that I do not like to see him thus behindhand in artistic work. Do not let our admiration for the art of the foreigner betray us into servile imitation of it. Let us learn from it all we can without sacrificing originality. All borrowed art is a mistake, to use no stronger word. To be good and lasting, art of all kinds must be national. Infuse a little patriotism into your art studies, and let each of you endeavour to show, as far as his abilities lie, that we here in England can originate a pot that is good and serviceable in form—pleasing and harmonious in colour. And now a word or two about colour. I am afraid you have not in your immediate neighbourhood very attractive landscape. Your atmosphere, if salubrious, is not more enviable than that of London; but whenever you can get the chance I would urge on you the great importance of sketching in colour from out-door Nature. You cannot very well apply landscape in a decorative way to pottery, but I can assure you that, so far as I know, no other study tends so much as this to improve the sensitiveness of the eye to delicate and beautiful colour. Nature never colours, as men will occasionally do, vulgarly. The colour of flowers, again, is more beautiful out of doors, or in the broad light of a glass house, where there are no heavy shadows (as in a darkened room) to detract from the purity and mass of colour. Of all art work there is none so instructive in the matter of colour as Oriental, and it is much to be regretted that you have little or no access to specimens. Eastern nations seem to have a natural instinct for colour, but for decorative colour and effect I know of none that exceed the Japanese. In form, often quaint and capricious, they seem ignorant of the beauty of the human figure, regarding it merely as a sort of clothes-horse, on which to hang rich and gorgeously-coloured draperies; but look at the action and 'go' of their figures, their birds, their plants, their quaint patterns, the number, and less ways in which they decorate a surface, and you will allow them to be at once the most original and delightful of decorators. The Japanese work on the principles of nature, and, like her, abhor symmetry. You seldom, if ever, see in their work vast wastes of symmetrical ornament or endless lengths of unvarying and meaningless scroll work so suggestive of 'at per yard.' When the gushing novelist tells us that his heroine's face and figure are faultless, in symmetry, we may be sure she is a very im-possible and uninteresting young person. No two sides of a face,—of a limb, of a leaf,—are alike. Imagine, if you can, a man constructed on symmetrical principles! Think of the starchy firmament with the stars placed at set and regular intervals! I wish you were surrounded by more of their work, and I would beseech those who have the interest of your schools at heart



and the means to testify that interest, that they would enable you to have at each of your schools here a little Japanese museum, consisting of screens, fans, books, pottery, &c., to serve as a means of colour education. The cost would not be excessive,—say about 20l. for each school,—and, by avoiding duplicates in the purchases, the collections might be transferred from one school to another, and thus keep up the supply of suggestive material. Speaking of the Japanese reminds me of a story I heard the other day. Kioto was formerly the seat of government in Japan, but, ceasing to be the capital, was falling off in prosperity. The governor, as a means of setting it up again, cast about to improve its manufacture of pottery. Hearing somehow of Smiles's 'Self-Help' and the story of Palissy the potter, he got a copy and had the story translated into Japanese. A play was fashioned out of the translation, and artisans were admitted free to the first twenty nights' performance; after which the piece was played on the usual conditions of payment. I do not know what the result was, but have little doubt that the lessons of indomitable energy, untiring perseverance, and singleness of purpose which the wonderful story of that patient potter teaches were not thrown away, but brought forth good and noble fruit. May we not also, whatever occupations we pursue, take example from this life of Palissy. Calumnies, disappointments, poverty, afflictions of all kinds, his wife even siding against him, all came in turn; but, nothing daunted, this brave man held on. He had set himself a task, and nought but death should make him throw it up. At length success crowned his efforts. He achieved a renown that will out-last even the work of his hands. His art was original, owing nothing to foreign imitation. In conclusion, let me impress upon you the necessity of work, and hard work, if you want to get on. Labour is the price set upon excellence in every study. Art in any shape is so absorbing an occupation that it is, perhaps, too much to expect that any one following it should come up to De Morgan's notion of an educated man as 'one who should know something of everything and everything of something'; but we should all endeavour to acquire as much culture and knowledge outside our immediate pursuit as we can. Cultivate a taste for reading, and store the mind with images and ideas. Read history, poetry, and good fiction; not trashy novels. Biography, again, is most interesting in its description of the struggles for success and the gradual achievement of the desired reward. Be simple and unaffected in your manners as in your art. Avoid eccentricity and conceit above all things. Be humble and hopeful, always doing your best, striving for the highest excellence you can attain. Patience and perseverance will overcome many an obstacle. As Shakespeare says:—

'Hercules himself must yield to odds,  
And many strokes, though with a little axe,  
Hew down and fell the hardest-timber'd oak.'"

Mr. Marks then distributed the prizes.

### IN THE FOOTSTEPS OF BRUCE.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the ordinary general meeting of this Institute, held on Monday evening last, Mr. Charles Barry, president, in the chair, M. Paul Abadie, and M. Theodore Ballu, members of the Institute of France, were elected by acclamation as honorary and corresponding members. The following gentlemen were then balloted for and duly elected, viz.:—As Fellows: Messrs. John Baird, John Burnet, John Carrick, James Salmon, William Forest Salmon (all of Glasgow), Thomas Mitchell (Oldham), J. T. Knowles, jun., and Thomas Porter (both of Westminster). As Associates: Messrs. Maurice B. Adams, Lewis P. Crace, and Frederick H. Reed (all of London), and Henry Barber (Ulverstone).

Professor Donaldson, past-president, then read a paper on the recent travels of Lieut.-Col. Playfair, H.M. Consul-General in Algiers and Tunis,—"In the Footsteps of Bruce." It seems that Colonel Playfair, finding himself the successor in office, after the lapse of a century, of the great African traveller, determined to search the Record Office for some account of Bruce's explorations. He did so, but found nothing; which is explained by the fact that Bruce had resigned office before setting out on his memorable travels. Colonel Playfair, however, subsequently found that Lady Thurlow, Bruce's granddaughter and heiress, of Kinnaird, was in pos-

session of the traveller's MSS., drawings, and collections, and these were generously placed at Col. Playfair's disposal. The drawings were on more than 100 sheets, some with subjects on both sides, illustrating ancient monuments of interest from Algiers to Pentapolis. Bruce had frequently expressed an intention to publish a work on the antiquities of Africa; but it does not appear that he did more than commence the letterpress, and up to the time of his death, in 1810, it was never completed. He had engaged a Bolognese draughtsman, one Luigi Balugani, who was with him for nearly two years in Algiers. He was Bruce's only companion in Africa and Asia, and he died in Palestine. Bruce had a good stock of materials, and a large camera obscura, which, with other conveniences, were packed in a case like a folio, about 4 ft. long. This greatly facilitated his sketching. The drawings were offered about forty years ago to the British Museum for purchase, but were declined. They have, however, been more than once exhibited at meetings of art societies, and some of the principal ones were selected on this occasion to illustrate Professor Donaldson's lecture.

Commencing with the tomb of Juba II., near Algiers, the lecturer gave a detailed description of its architectural features, which resembled the Etruscan tombs at Cervetii and other ancient towns near Civita Vecchia. The next building mentioned in Colonel Playfair's diary is the Aqueduct of Constantina, memorable for the siege and gallant capture by assault of the French in 1837. It was built on the flat summit of an insular rock, which rises up nearly 1,000 ft., with perpendicular sides, surrounded by mountains. On this plateau was the residential city of Syphax and succeeding kings, adorned with palaces and other edifices of splendid character. Around the base of the rock flows a tributary of the river Ampaga. Professor Donaldson next described the once important town of Sufetula, in the Byzacene province, which formed part of the Carthaginian territory. In Bruce's time it was surrounded by a forest of white firs, which have all now disappeared. He mentions an inclosure, or hieron, of large dimensions, and entered by an archway. Here were three semi-detached temples, of which the central one was dedicated to Bacchus. To the south of the town is a triumphal arch, erected in memory of Constantine, A.D. 305-6, the inscription bearing not only his name, but that of Maxentius. Col. Playfair found the form and disposition of the ancient city still apparent, and many of the streets could be traced. He feels convinced that excavations, judiciously carried out, and especially in the hieron, would bring to light many objects of archaeological interest. Makther, Assuræ (the modern Zarefona), and Thugga, or Dugga as it is now called, were next described. In the last-mentioned city is the celebrated mausoleum, from which the bi-lingual inscription now in the British Museum was obtained. Bruce left a mere pencil sketch of this interesting structure, which was almost entirely destroyed by Sir Thos. Reade, the British Consul-General at Tunis, in order to remove the stone on which the inscription was carved. Col. Playfair remarks that this mausoleum and the Madrasen, are the only monuments in North Africa of pre-Roman origin, and the only examples remaining of the style employed by the early aboriginal races. There are remains of numerous temples, a theatre, and other buildings, at Thugga, indicating great magnificence and architectural taste. At Tripoli, the most notable ancient monument is a triumphal arch, now buried in sand up to the middle. It was built of fine solid marble on which time and weather have had little effect. Many years ago it fell into the hands of the present owner, a Maltese wine-merchant, who, after converting it into the principal wine-shop of the town, made use of it as a warehouse, and it is now filled with casks and boxes. Hydera (the ancient Ammodara) belongs to the Hyderines, though it is inhabited by the Welled Boogaunim Moors of Tunis, whose saint is buried here. By the instruction of their founder they are obliged to live on lion's flesh as far as they can procure it! In consideration of the utility of this vow they are not taxed like other Arabs, with payments to the State. Here is another triumphal arch, dedicated to Septimius Severus, of peculiar design, but not equal in grandeur, to that of Thamugas, the finest of the series of which a drawing was exhibited.

At the conclusion of Professor Donaldson's

lecture a vote of thanks was passed to the author by the meeting.

Mr. T. N. Laslett then read a short paper descriptive of the "Metroscope," an instrument for measuring the height of inaccessible buildings.

### THE BROMSGROVE SEWAGE WORKS.

THESE works, which have just been completed at a cost of about 3,500l., were formally opened by the members of the Bromsgrove Local Board on the 30th ult. They are situated in a field near Churford Mill, containing about four acres, upwards of two of which are covered by the different filtering-beds. Some five years ago the Board was threatened with an injunction to restrain them from turning the sewage into the town brook, and causing a nuisance by contaminating the stream. They called in the services of Mr. Bailey Denton, engineer, who advised them to purchase about forty acres of land and carry the sewage a mile away from the present site, which would have cost about 20,000l. The Board did not feel justified in expending so large a sum, and called in requisition the services of Mr. Taylor, engineer, who prepared plans, which were approved. The consent of the Local Government Board was obtained, and the works were carried out by Messrs. Brazier & Weaver, of Bromsgrove. The sewage is conveyed from the town by a pipe sewer a distance of half a mile, and at the outfall is led into a duplicate set of subsiding-tanks and filter-beds. From the outfall it flows into a shallow tank having an area of 200 ft. In this tank the heavy matter of the sewage precipitates itself. The sewage then passes into a second subsiding-tank, having an area of 900 ft., and at the end of this tank is a wall containing a number of pipes through which the sewage passes, and when the tanks are full these pipes are below the water, which prevents the floating matter in the sewage passing beyond the wall. It then runs into a subsiding tank with an area of 1,600 ft., in which further subsidence takes place. Beyond this tank is constructed a filter-bed of 600 ft. area, in which is fixed a perforated floor, covered with engine ashes; the sewage, passing upward and through the ashes, goes over a weir 30 ft. wide, by which a very gentle motion is given to the water. It then reaches a fifth tank, and beyond this is another filter, constructed similarly to the first, but having a larger area, and being a downward filter, the sewage passing through the ashes, and thence into an open carrier, which conveys it to the land-filters. Each tank is built and paved with brick, the bottom being made to slope to the centre into a well or pit, at the bottom of which is a large brass valve. Into this pit the mud is swept, and passes through the valve into a mud pit 18 ft. deep, in which is fixed a strong chain-pump, which is worked by two men. By this means the mud is raised to the surface, dried, and sold for manure. The whole of the tanks, wells, &c., are in duplicate, so that one set can be cleaned while the other is at work. After passing through this system of filtration the sewage goes into the land-filters, fifty in number, each having an area of 2,500 ft., formed by levelling the land and raising round each bed an earth embankment. The land has been closely drained, upwards of three miles of pipes having been used. The sewage passes from the open carriers through sluices into pipes, and on to each bed. The surface soil of each bed is thrown into furrows, and the sewage gradually filters through the ground into the drains, which empty into the main drain. The water comes out clear and bright into the brook. Arrangements have been made for dealing with storm water. Several gentlemen tasted the water, and pronounced it "good."

Mr. E. M. Ward, R.A., and the Windsor Town Council.—The Windsor Town Hall has recently been undergoing repairs, and in the work of renovating and restoring the pictures which it contains the Council has had the valuable assistance of Mr. E. M. Ward, R.A. At a meeting of the Council last week, Alderman Devereux proposed a vote of thanks to the ex-Mayor for the great attention he had paid to the restoration of these pictures; also a vote of thanks to Mr. E. M. Ward, for the voluntary manner in which he came forward to give advice, and assist the ex-Mayor in their restoration; also to the Town-clerk for the valuable assistance he had rendered.



## BUILDING DISPUTE AT LINCOLN.

RAVIN V. FAULKES.

THE parties to this case (heard in the Lincoln County Court) live in Lincoln, plaintiff being a journeyman builder, and defendant a master man. The claim was for 2l. 10s. 10d., balance of an account for work done.

The plaintiff's case was, briefly, as follows:—Plaintiff and a man named Giles in July last agreed with the defendant to complete the building of two houses, the property of the ex-mayor (Mr. Beard), for the sum of 6l. 10s. Defendant was to find all the materials, and plaintiff and Giles were not to do any work except in the inside of the house. They started on the work, but after they had been engaged a short time they found that the materials were not properly supplied by the defendant, with whom plaintiff and Giles had a conversation on the subject. They told him that if he did not supply the materials they should consider the arrangement which had been entered into was "knocked on the head," and they should charge him by the hour. Defendant then said in the future it would be all right, the proper amount of materials should be provided, and he would give them a sovereign to make up the loss they had sustained previously. Materials were not, however, supplied, and plaintiff and Giles were obliged to leave off the work; the contract could not be fulfilled as defendant did not supply the materials. Plaintiff and Giles each worked 368 hours, value 11l. 17s. 8d., or 5l. 18s. 10d. each. At different times they each received 3l. 8s., leaving a balance due of 2l. 10s. 10d. each.

A similar claim was brought for the same amount by Geo. Giles against Faulks, but after hearing the evidence adduced on both sides.

The Judge said he did not think there was any foundation for the actions, and gave a verdict for the defendant.

## AN ARCHITECT'S CLAIM FOR SERVICES RENDERED.

LACEY V. HEENAN.

THIS was an action tried in the Exchequer Division of the High Court of Justice, on the 30th ult., before Mr. Baron Pollock and a common jury, and was brought to recover a sum of 121l. 16s. for work and labour done and commission.

It appeared that the plaintiff was an architect carrying on business at 12, Buckingham-street, Strand, and was employed by the County Fire-office as their consulting architect. The defendant was a wine merchant, and until recently on very friendly terms with the plaintiff. Some time back the defendant was anxious to have a house built for himself on his own plans, and engaged the plaintiff to carry out his design. Sites were looked at and almost decided upon at Hampstead and Finchley-road, but ultimately a plot of ground was purchased by the defendant on St. Margaret's Estate, Twickenham. A contract was arranged with a builder, the land was laid out, and the house commenced, and the plaintiff claimed the above sum for his services.

Mr. Cole, Q.C., and Mr. Grantham appeared for the plaintiff; Mr. W. M. Intyre, Q.C., and Mr. Thomas were for the defendant.

The Judge during the second day of the hearing, by the request of counsel on both sides, consulted with them, and expressed an opinion, in accordance with which a verdict was given for the plaintiff for an amount which was not made public.

## FINDING SURVEYORS' INSTRUMENTS.

MR. BRUNTON, surveyor to the Durham Board of Health, requiring a spirit-level, at a cost of 16l., for drainage works, considered it was the Board's, and not the surveyor's, privilege to pay the mathematical instrument-maker, and accordingly applied to the Board to supply him with the requisite order.

A member of the Board inquired if there were not a special arrangement with surveyors, when they were appointed, to find their own instruments. His opinion was, that when Mr. Brunton was appointed some reference was made to expensive instruments of this description, and that he said, as they were so seldom wanted, he could borrow them.

The surveyor's written appointment was read, but it contained no mention of instruments, either one way or the other.

No action being taken on the application, it remains for Mr. Brunton to either find an instrument at his own expense, borrow one, take the drainage without a level, or leave the work undone. A proper understanding on the question should at once be arrived at.

## Proposed New Railway Station, Dublin.

SOME stir has been caused in Dublin by a project, of which Parliamentary notice is given, to continue the Westland Row Railway from Kingstown on a viaduct through Trinity College Park and the Fellows' Garden, and to knock down the Provost's house in order to erect a Central Dublin Station in the neighbourhood of College Green. It is suggested that the money compensation obtained would solve the vexed question of a fund for retiring pensions for Senior Fellows.

## THE OLD PALACE, RICHMOND.

A SOMEWHAT curious litigation is proceeding in the Court of Chancery, before Vice-Chancellor Malins, respecting a contract to purchase the remainder of the lease of the Old Palace at Richmond, a mansion of great historic interest, the reversion of which is in the Crown. The plaintiff is the Hon. Mr. Mainwaring, and the defendant is Colonel Wilbraham. The colonel, it appears, agreed to purchase the lease of the property on certain terms, "subject to approval of the lease." When the lease was perused, it was alleged that the Crown had imposed a fine of some hundreds of pounds upon the renewal of the lease in the year 1820; and it was objected by the defendant that as the lease he was buying would expire in a few years, he would be unable to renew it except on payment of a similar fine to the Crown. This, the defendant asserted, he was assured by the plaintiff, before the purchase, would not be insisted upon; whilst the plaintiff's case was that no representations, beyond an expression of opinion, were made on the subject. It appeared that no intimation had been received from the Crown that any such fine would be required, and that the matter was one of conjecture only. The performance of the contract was, however, refused by defendant, as he inferred that what had been done in 1820 would be repeated by the Crown at the expiration of the present lease. The suit, which is for specific performance of the contract, is proceeding on the oral evidence of the parties.

## A COTTAGER'S WISH.

OUR cottage has step-gabled ends,  
Low drooping eaves, quaint nooks and bends,  
With lattice windows, diamond-paned.  
The sunny porch has jasmine train'd;  
And midst the weather-beaten tones  
Are moss and lichens on the stones.

A garden there is spread around,  
With fruit-trees bending to the ground,  
And on its mellow walls, as well,  
Neat plaited hives, too, I may tell,  
And drowsy bees are stumbling through  
Our beds of lavender and rue.

And near, on daisied meadow low,  
You see Sweet Pea, our brindled cow.  
She seeks the shade of pleasant trees  
That wave and whisper in the breeze,  
Near where the spring, nor broad, nor deep,  
Comes babbling down the hill-side steep.

To dine off herbs with love, not gold,  
Is fare beyond stall'd ox, we're told.  
I doubt it not; and, further, find  
No home, not mine, quite to my mind;  
And like to make myself content  
With that the Lord of All has sent.

But, oh! the smells, the smoke, the damp,  
The pools of mud through which we tramp,  
The pools of water when it rains!  
And all for want of proper drains!  
I would the *Builder*, when he roams,  
Would next inspect our cottage homes.

## VENTILATION OF CHURCH.

SIR,—Your querist, "Q. Q.," has only to remember the simple rule of nature in treating his church so as to ensure a regular, uniform, and sufficient change of air for the wants of the congregation, viz.,—that consumed and effete air, from its warmth, always ascends to a higher level. It is a fallacy to suppose, as is sometimes taught, that the carbon di-oxide, and the volatile organic matter expelled from the lungs, or from the combustion of artificial lights, lies at a lower stratum. The contrary has been conclusively demonstrated by Pettenkofer, and also in my researches on the quality of air in buildings, published in the *Lancet* some few years ago.

This teaches us that there should be inlets for fresh air and outlets for foul air. The positions to be selected can only be determined by those on the spot, as also the superficial capacity of the apertures. Practice, however, shows that a thin stream of air is more regularly diffused, with less tendency to draught, than a more solid current. Cold air entering a room always inclines to flow downwards, thus creating draughts; therefore it should be introduced at an angle of elevation of not less than 45° with the plane of the building, but not so much as 90°.

This desideratum may be obtained by a deflector, or by the eashes or other openings being permanently fixed at the requisite slope. The position of inlets should be not less than 6 ft. above the floor line, and where there are galleries additional openings at a corresponding height above the upper tier of seats. The outlets are best arranged in the roof, and may be of rather smaller superficies than the inlets. This is simple, natural, and inexpensive ventilation, self-acting and thoroughly efficient.

The heating medium may be any of the excellent stoves now obtainable. The supply of air for combustion, however, should be procured from outside the building. And,—need it be said?—care should further be taken to conduct the consumed air to the outside. This suggestion may seem superfluous, and some may smile at its simplicity, and I would not have ventured to refer to it, only from the circumstance of having this very day observed that the entrance-hall of a West End club is heated by a charcoal stove without a flue! Moreover, the number of gas stoves burnt during cold weather in shops and rooms without fireplaces or apertures for ventilation into which the vitiated air enters is alarmingly on the increase, at which, doubtless, our medical brethren will be much distressed! The condition of public buildings is simply disgraceful: churches, chapels, assembly-rooms, clubs, hospitals, institutions, lecture-halls of scientific and professional societies, schools, and all places where people collect for business or pleasure, from all these fresh, invigorating, wholesome air is shut out. The subject is one in which the public take no substantial interest. It is true we talk about it, write, discuss, and read lengthy papers,—in fact, do everything but perform; and I believe it is rather looked upon as a sign of delicacy of constitution and effeminate to make complaint or suggest remedial measures.

Take any of the national structures, completed, as it were, but yesterday,—buildings costing immense sums,—and they are no exception, as the same grave defects are tolerated and the simple rules of ventilation are ignored and thwarted.

It is satisfactory to find that one responsible member of the church has a desire to assist the material welfare of the flock, and seeks the help and advice of your columns. The clergy have the power, and only need the will, to set in motion very simple machinery for effecting great benefit to the millions by giving them clean air to breathe in God's House, and thus perform efficient aid towards reducing the enormous number of annual deaths from lung diseases, which exceed in the aggregate all the zymotic complaints combined.

Let there be light and pure air, the first of Heaven's gifts, and a rapid diminution of mortality will follow in that class of foul disease, fell destroyers of the breathing organs.

RICHARD WEAVER, C.E.

## THE PREVENTION OF ECHO.

SIR,—Your correspondent, J. N. A. MacDonald, may see the application of wires for destroying echo in the Chapter-house of York Cathedral, where I saw it a few days ago; but I may tell you it is a failure, and no wonder. I have seen it tried in two other instances with the same result. The theory of it seems to be to produce lesser waves of sound within the larger ones, as when two pebbles of unequal sizes are thrown into still water, the concentrated waves are mixed up and neutralise each other.

I have tried large metal frames suited to the purpose (and which when up are almost invisible) and filled in with wire gauze in two thicknesses half an inch apart with a good effect, and better still when filled in with worsted threads. But the most effectual mode was found to be by suspending fringes, as I may term them, of worsted threads about 3 ft. long, more or less depending on circumstances, and fixed in such positions as the form and section of the building necessitate.

GEO. GLOVER.

SIR,—Since the date of the correspondence in the *Builder* in 1874 respecting the use of wires to improve the hearing in churches, an experiment has been made in Bath Abbey. If your correspondent were to communicate with Canon Brooke, the rector, probably he would be able to obtain some information as to the materials employed, and the success or otherwise of the system.

A. J. STANTON.



## SCIENCE LECTURES AT SOUTH KENSINGTON.

THE free lecture on Saturday evening last in connexion with the Loan Collection of Scientific Instruments was given by Mr. J. Starkie Gardner, F.G.S., and the lecture-theatre was crowded. The title of the lecture was "The Tropical Forests of Hampshire." Mr. Gardner said England at the present time has a climate far from tropical, but the time to which I refer was when the palm and spice plants flourished here; and before I have done I hope to have shown you that the climate at that time may rightly be spoken of as tropical, not in a poetical or metaphorical sense, but actually. The data on which our inferences are based are the fossil leaves which we find in the clays of the south of Hampshire. It is the middle fresh-water series which is so rich in the clay beds containing fossil leaves. These leaves are found in various conditions of preservation. In most cases the impression only of the leaves in the clay is met with, but in some cases they are so well preserved that the actual substance has been retained although chemical changes have altered its composition, and it will peel off and blow away. Among others the following fossil forms were mentioned as having been determined with but little doubt:—Feather and fan palms, dryandras, beech, maple, azalia, laurel, elm, acacia, aroids, cactus, ferns, conifers, stenocarpus, and plants of the pea tribe, together with many others. After mentioning that in the two lower fresh-water series there are no animal remains but what have been blown in, among them insect wings and the earliest known English feather, the lecturer went on to speak of the physical conditions under which he supposes the beds were formed. He said that he regarded a river flowing from west to east as having deposited all these beds in a valley of from seven to ten miles, which it had made, and showed a picture of the restoration of what he supposed the view was like. The foreground of the picture was made up of plants from Mrs. J. E. Gardner's conservatory, being the nearest known living representatives of the fossil plants.

## BUILDING AND TRADE UNIONS IN GLASGOW.

GLASGOW PHILOSOPHICAL SOCIETY.

ON the 29th ult. the members of the Glasgow Philosophical Society met in the West Hall of the Upper Corporation buildings, when Mr. John Honeyman, president of the Architectural Section, delivered his opening address to that section, the topics dealt with in which were "General Building Regulations, Purification of the Clyde, Health of the City, and Trade Unionism." Dr. Wallace presided.

Mr. Honeyman, after some preliminary observations, referred to the subject of the classification of house property and general building regulations. He said,—Now it so happens that in Glasgow we have neither good building laws nor proper machinery for giving effect to good laws if we had them. The first assertion is, I think, admitted by all who are conversant with the subject; and, I believe, the second is about equally notorious. The Dean of Guild Court is an institution of the past—well suited for a state of matters which, so far as Glasgow is concerned, has long since ceased; and although I do not say that it is impossible to adapt it to the altered circumstances of our times, there can be little doubt that the attempts which have hitherto been made to do so have proved abortive. The Corporation cannot much longer delay applying for an Act to regulate the laying-off of land for building purposes, the erection of buildings, and other cognate matters; and I think that the members of this society, and especially the members of the Architectural Section, are bound to take the whole subject into consideration, and to encourage and assist our municipal rulers to obtain such a measure as shall, without unduly interfering with the rights of property, disturbing the proper owners of responsibility, or discouraging ingenuity and invention, ensure the erection of safe and comfortable houses, and protect the citizens from what I may call the three Fs,—"Fratry, Fire, and Fever." The Local Government Board are at present engaged on model building regulations, which will probably facilitate the labours of authorities who find it necessary to obtain special legislation. Such legislation may probably be necessary in Scotland, because good regulations are of no use

without proper machinery for giving effect to them, and that we have not, nor does the Local Government Board intend to deal with that part of the subject. There may be, indeed there are, reasons why an Act of this sort should be applicable to Scotland alone, but I can imagine no reason why it should be applied for by Glasgow alone, or Edinburgh alone, or by any other large town; and it is earnestly to be hoped that the municipal authorities in all our large towns may combine and obtain a thoroughly good Building Act for Scotland. Referring to another subject which has been a good deal before the public of late—the purification of the Clyde—Mr. Honeyman ultimately said,—I would conclude my reference to this subject by making the following suggestion:—that our corporation offer a premium of 1,000*l.* to the author of the best practicable scheme for removing all excreta and other refuse from our houses and works, in such a way as not to affect injuriously the health of those occupying those houses, or of the inhabitants in general; and five premiums of 50*l.* each to the authors of schemes which may be deemed of secondary merit. Also, that they should offer a similar premium of 1,000*l.* for the best scheme for dealing with refuse from public works, with the view of preventing any noxious substances being thrown into the Clyde; and five premiums of 50*l.* each for schemes deemed of secondary merit. If they did so I have little hesitation in predicting that we would find ourselves in a position to dispense with the expenditure of 3,000,000*l.* on the purification of the Clyde for a good many years to come. After referring briefly to the exceptionally healthy state of Glasgow during the past year, the cause of which, he said, was worthy of being seriously investigated, as it was not by any means obvious, Mr. Honeyman proceeded to say:—There is only one other subject to which I shall allude before resuming my seat, and I am the more anxious to avail myself of this opportunity of referring to it, because I am perfectly satisfied that you do not, and that the general body of the community do not, realise as they ought how intimately it concerns them, both individually and collectively. The subject I refer to is the relations of labour and capital—trade unionism, in short, with its attendant train of strikes, high wages bad work, and little of it. Now, as I wish very strongly to express my abhorrence of trade unions as now developed, and the results of their action, I feel bound, first of all, to disclaim emphatically any abhorrence of workmen or any partiality for masters. Having given the subject much attention for many years, and watched with growing anxiety and alarm the development of issues long since foreseen and indeed inevitable, I shall tell you the conclusions I have arrived at, although it is obviously out of the question in the course of such an address as this to expound the reasons which have led me up to them, and these are:—First, that trade unions, in so far as they disturb the natural relations of workmen and their employers, and interfere with the exercise of private judgment and the right of every man to make the most of the abilities and manly vigour God has given him, are an unmitigated and irremediable curse to this country; second, that, while the chief sufferers are neither the masters nor the men, but rather the great body of the people, who have to pay for bad work, slow work, and work as dear as the men,—or the men and the masters between them,—choose to make it, this same public and their rulers utterly fail to apprehend this; and, third, that unless they do awake to the realisation of this fact, and ere it be too late, take measures to counteract and sternly prohibit the gross abuses of trade unionism, it requires no great foresight to predict that the day which shall determine Britain's pre-eminence is not far off. To illustrate this subject as I should like to do would occupy a great deal more time than you can afford to-night. I shall only attempt in the few minutes still at my disposal to make one or two very general observations on the subject. The most remarkable thing about it, I think, is the apathy and unconcern of all classes who are not directly engaged in some of our trades; because it needs but little reflection to perceive that if the productive power of the country is paralysed by an abnormal state of things, which at the same time limits the produce and enhances the price of it without increasing the wealth of the consumers, these are put in the unhappy position of being compelled to pay more than the produce is worth, and ultimately more than they can afford to pay. Such a result could not follow the free

operation of the laws of supply and demand, but the unnatural disturbing element of trade combinations makes all the difference. These aim at securing for the workmen more than their labour is actually worth, and, exactly in proportion as they succeed in doing this, they rob the community and undermine the prosperity of the country. There are branches of industry in which the influence of foreign competition offers, at the expense of our national prosperity, a certain check; but there are others, and notably those with which the members of our section are more immediately concerned where there is absolutely nothing to check the most extravagant demands, unless the great body of our long-suffering people arise and stand on their defence. It may be a matter of surprise to some that the men themselves fail to perceive that the consequences of their present mode of action must react upon themselves; that they are not only blind to their own true interests, but deliberately regardless of others; that they do not see that the despotism of any mere section of the community may be even more dangerous to the State than that of an individual irresponsible ruler; and that the protection they are bent upon establishing is of a character infinitely worse and more inimical to the prosperity of the country, and therefore to the true interests of the working classes themselves, than that which the great wave of free-trade agitation swept, let us hope for ever, away; but it were vain to expect any such enlightenment. It would be surprising, indeed, if they either saw or cared for anything of the kind, and much more if such foresight should affect their conduct in any way. The ignorance and perversity of some of those who speak for them, and attempt to guide them, is less excusable; but the truth is that patriotic considerations have very little, I may say nothing, to do with the commercial transactions of any section of the community, and it would be absurd to expect workmen to foresee or weigh the effect of their acts on the future destinies of the country.

## BUILDING ON STOCKWELL GREEN.

SINCE the dispute was settled as to the right to appropriate Stockwell-green as building land, which was decided in the affirmative on behalf of Mr. Honey, the freeholder, the green has been laid out for building purposes, and already several houses have been erected, and are now almost ready for occupation, whilst others are in progress, and in a short time the entire area will be covered with bricks and mortar. The east frontage facing Stockwell-road, as well as that on the west side, will chiefly consist of shops, whilst about the centre a thoroughfare runs across the green. Immediately opposite the green, on the east side of Stockwell-road, extensive building operations are likewise in progress. In order to clear the site for these new buildings, one of the oldest mansions in the neighbourhood has just been demolished. It was built about a century and a half ago, and was for many years the residence of a family of London merchants, but for some time past it has been known as the Stockwell Collegiate School. The interior fittings showed its ancient character. The staircases and stairs were all in blocks of oak, and the hearthstones in marble. Mr. Snelling, an extensive builder in Stockwell, has purchased the property, and it is stated that it is the sixth of the old historical mansions which that gentleman has purchased and demolished within the last few years, Stockwell Hall being amongst the number.

## STATUES.

*Sir Robert Peel.*—The foundation for the erection of a statue to the late Sir Robert Peel is now in active course of preparation in Parliament-square, Westminster. Some years ago a statue of the late statesman was erected in Old Palace-yard, designed by Baron Marochetti, but it was universally condemned and ultimately destroyed. It has now been decided to erect another statue in Parliament-square, and the proposed work was designed by the late William Noble.

*Captain Cook.*—Mr. Woolner, it is stated, has now completed the model of a statue of Captain Cook, the navigator, which is destined for Australia. The statue is 13 ft. high, will be executed in bronze, and will stand upon a pedestal 36 ft. high, in Hyde Park, Sydney. Cook is represented in an attitude of surprise at



the discovery of a new lancet, which he has just made by means of the telescope, which he holds in his left hand. The dress is that of a naval officer of his time, with broad lapelled coat, large cuffs and pockets, a long waistcoat, and broad-toed shoes. It is understood that the model will be Mr. Woolner's chief exhibit at the Royal Academy Exhibition in May.

#### OPENING OF THE VICTORIA SKATING-RINK, PECKHAM.

A FEW months ago large new swimming and warm baths, which had been erected by Mr. Higgs (formerly of the firm of Hill & Higgs, builders), in St. Martin's road, Peckham, were opened to the public under the name of the Victoria Baths. Mr. Higgs purchased between one and two acres of land for the purpose, which had been occupied as a market garden. A portion of this, at the south end, near Peckham-road, was reserved for a skating-rink, and since the opening of the baths the rink has been in course of construction, and being now completed was opened on Saturday last. The rink is about 200 ft. long, and 60 ft. wide, and contains a skating area of 12,000 square feet, in addition to spacious and convenient promenades, together with retiring-rooms. The floor is laid with asphalt, and the rink is partially covered in with an ornamental wooden and glass roof, uniform in design with those which inclose the baths.

#### OBITUARY.

We announce with personal regret the death of Mr. William Ifold, at his residence in Manchester-street, where he had carried on his business as a surveyor for upwards of sixty years. He was a pupil of the late Mr. Day, who, half a century ago, was a prominent measurer of the old school. Mr. Ifold enjoyed considerable practice as a compensation valuer; he was a man of rigorous integrity, and, perhaps, the senior surveyor in practice at the time of his death. He was in his eighty-second year.

#### THE ST. GOTTHARD RAILWAY.

THE special commission appointed by the Swiss Federal Council to report on the reconstruction of the undertaking of the St. Gotthard Railway has concluded its labours. The commission rejects the proposed laying down of a single line of rails throughout the length of the railway. All the portions of the line the widening of which, at a later date, would be attended with too great an expense are to be constructed at once with a permanent way for two sets of rails, although they will receive at present only one set. It has also been resolved to abstain from using any of the special systems proposed, such as Fell's, Agudio's, &c. If the whole net of railways in the St. Gotthard district is carried out in accordance with the project contained in the international treaty, the deficit, estimated by M. Hellwig, the engineer, at 102,000,000 francs, will be reduced to 71,829,000 francs, and, if the lines from Zug to Arth, and from Lucerne to Immensee, are abandoned, to 59,454,000 francs. As regards the lines at the south side of the St. Gotthard, from Bellinzona to Lugano, and from Cadanazzo to Pino, no definite resolution has been come to, as the decision rests in the first place with Italy. The point whether, instead of a railway from Lucerne to Flüelen, a steam ferry is to be established on the Lake of the Four Forest Cantons, is left for the international conference to decide. The yearly traffic is estimated at 250,000 passengers, and 400,000 tons of goods, and the yearly revenue at 52,000 francs per kilometre, which would give for the total length of 268 kilometres a total yearly revenue of 13,936,000 francs, while the working expenses, inclusive of the reserve fund, are calculated at 26,000 francs per kilometre, or 50 per cent. of the revenue. The yearly net income would consequently amount to 6,936,000 francs, or, in round numbers, 7,000,000 francs. This income would provide interest, at the rate of 5 per cent. for 140,000,000 francs; now, the whole capital amounting to 259,000,000 francs, 119,000,000 francs will remain to be covered by subventions. But as of this sum already 80,000,000 francs (45,000,000 francs by Italy, 20,000,000 francs by Germany, and a like sum by Switzerland) have been voted, there remain 34,000,000 francs still to be supplied; and if interest at the rate of 6 per cent. is paid, 54,000,000

francs. It will thus be seen that sacrifices will yet have to be made if the undertaking is to be carried out; but they will not be of such a nature as will not be commensurate with its magnitude, and as would be beyond the ability of the company. As regards the maximum rise of the railway, it was fixed by the commission at the highest points at 25 in 100, at the intermediate points at 26, and at the lowest points at 27 in 100. For the line of Monte Cenero, a rise of 20 to 21 in 100 has been adopted; for the valley railways, about 10 to 12 in 100. The smallest radius found practicable for short curves is 280 metres, if thereby a considerable saving is effected; but as a rule 300 metres is to be considered the minimum. If the means cannot be found for the works resolved upon by the federal commission, further reductions will have to be made by the international conference. The Federal Council has at once taken in hand the drawing up of the general report to be submitted to the conference, to ensure its being called together at an early date.

#### GRANITE.

SIR,—There is an article in your last paper about granite building. It is a pity that parties who supply polished granite for smoky towns like London do not recommend their clients to wash it at the same time that they wash their windows. London soot is so tenacious that it will adhere to the fine polished plate-glass, and it adheres equally well to the glassy surface of the polished granite. If the above plan were adopted with the polished granites, it might be said of them, in the words of the poet:—

"A thing of beauty is a joy for ever."

I strongly recommend all parties using polished granite to wash it quite as often as they do their plate-glass windows.

SAMUEL TRICKETT.

#### SURVEYORS' CERTIFICATES.

SIR,—I shall be glad to have an opinion on the following, as several of your readers are interested.

A, a solicitor, has advanced some money on mortgage to B, a builder, and the building having come to a standstill, B finds a person willing to help him to complete, if A will undertake to pay, on completion, a certain sum, say 300*l*, when the works are completed to the satisfaction of C, the surveyor, who has certified the advances. After considerable delay, the surveyor, relying on certain statements made by the builder, reports the completion. Through some discussion about other matters the money is not paid, and the surveyor, finding that the certificate was obtained by false statements, gives formal notice of its withdrawal. The amount has, of course, not been paid, but the solicitor calls upon the surveyor to complete the houses at his own expense. An independent solicitor gives an opinion that the solicitor has sustained no damage, and therefore the surveyor has incurred no liability. The question is, can a certificate be withdrawn if certain defects, discovered before the money is paid, justify such a course of action?

The surveyor has received no remuneration for his work in the matter.

SURVEYOR.

#### COMPETITIONS.

**Leeds Municipal Buildings.**—With reference to the observations made to us, and to which we gave expression, concerning the drawings submitted by the architect of the London School Board, Mr. Robson (p. 1163, ante), we are informed that the drawings were made at his private office, and wholly irrespective of the School Board staff. Mr. Robson is not precluded from private practice by the terms of his engagement with the Board.

**Wakefield School Board Schools.**—At a special meeting of the Wakefield School Board, a few days since, a report was received from the committee appointed to consider the merits of the nine sets of plans submitted by competing architects for the proposed new schools at East-moor. On the recommendation of the committee, the Board adopted the designs of Mr. W. Watson, architect, of Wakefield.

**Monument to the Late Mr. Joshua Hobson, Huddersfield.**—The executive committee met on the 27th ult. for the purpose of deciding upon which of the two designs, selected from forty-one sent in for competition, should be adopted and erected to the memory of Mr. Hobson. The designs submitted were the bandywork of Mr. Walsh, of Woodhouse-lane, Leeds; and Mr. George Dyson, of Crosland Moor, Huddersfield. The voting was by ballot, and resulted in favour of Mr. Geo. Dyson. The obelisk will be 18 ft. high.

**Serjeants' Inn.**—Early in the spring of next year Serjeants' Inn, Chancery-lane, will be offered for sale by auction. The property is described as belonging to the Honourable Society of Judges and the Serjeants-at-law. We stated some time ago that this property would be sold, and were not believed.

#### A SELF-ACTING FIRE EXTINGUISHOR.

CHEMISTRY and mechanism must be called in to stop fire from destroying houses. Carbonic gas puts out fire. Now, if this gas is brought to bear on a fire at the outbreak, the desideratum will be attained. I have made an extinguisher (at a cost of ten shillings). I propose to remove a floorboard, to attach the extinguisher to a rafter over any room to be guarded. I perforate through the ceiling a pinhole, to insert a tiny cotton fuse: this will not be seen, and cannot be tampered with. In the event of a fire, it instantly generates carbonic gas, precipitating it on to the fire. Carbonic gas being a heavy gas, it would not escape up the flue; doors and windows must be closed, to let the extinguishing gas do its work unmolested by firemen and others.

R. T.

#### Books Received.

**Business.** By JAMES PLATT. New Edition. London: Simpkin, Marshall, & Co. 1875.

We want in every parish, Mr. Platt says, a gymnasium and a proper system of physical exercise. Until we obtain this he advises us to get all the outdoor exercise we possibly can; but, says he, "you cannot be too particular in avoiding one fatal error—that of hardening yourself, as it is termed, by exposure. . . . After being indoors all day you cannot be too particular in keeping your mouth shut for some time after going into the air. Very few can stand with impunity talking or having their mouth open with the north or east wind in their face. It is a great mistake to imagine that by exposure men are either strengthened or rendered hardy; they must be strong and hardy before they are fit to be exposed; they must be seasoned first and exposed afterwards. This mistake has been engendered by seeing how hardy and apparently impervious to all weathers are those whose occupations keep them out-doors all day in all weathers; it is very different for the majority engaged in business, who are compelled from morning to night to breathe a close and vitiated atmosphere, arising from bad ventilation and often imperfect light." This is not the only piece of sensible advice given by Mr. Platt.

**Molesworth's Pocket-book of Engineering Formulae.** London and New York: E. & F. N. Spon. 1876.

THIS is the eighteenth edition, with additions by the author, and a contribution by Mr. B. S. Brough, on "Telegraph Construction and Electrical Formulae." "Molesworth" has become quite an authority in engineers' offices. On the principle that it is necessary only to do, not to know, assistants do not hesitate to adopt the formulae given, without question of their truth. Fortunately, in this case this course does not lead to error. That is more than we could say of some other pocket-books.

**Roorkee Manual of Applied Mechanics.** By Captain ALLAN CUNNINGHAM, R.E. Printed at Roorkee, 1876.

A MATHEMATICAL investigation of the strength of materials used in bridges and roofs, and of the strains to which they are subject.

Authorities,—a score,—have been consulted in the preparation of the work, beginning with Belidor, and including Barlow, Rondelet, Tredgold, Morin, Moseley, Hodgkinson, Rankine, and many others. The result is a useful little book.

**Cremation in America.**—The first cremation furnace in America has just been constructed on Gallows-hill, about a mile from Washington, Pa. It is described as being built of brick, one story in height, with a roof of corrugated iron; it has three chimneys and two rooms; in the reception-room there is a catafalque, with a few chairs for mourners; the furnace in the cremation-room is 7½ ft. long; coke will be used in heating the retort; the human ashes will be collected in a small box, and stored in a glass case in the reception-room, "with label, photograph, and poetry, if needed." No fees will be charged for incineration, inasmuch as the furnace has been dedicated to the poor by the owner, Dr. F. Julius Le Moyne. On the whole, it is described as a very pleasant place in which to roast a dead friend. The first utilisation of the furnace was upon the body of an Irish labourer who helped to build it, and who desired his remains to be thus disposed of.



## Miscellaneous.

**The Royal Society.**—The anniversary meeting of the Royal Society was held on the 30th ult., at Burlington House. The president, Dr. Hooker, in his address to the assembled fellows, gave a summary of the work of the Society, as carried out by the Council, during the year then expiring, and particularised the subjects most worthy of attention. Among these were the long-pending Handley bequest of nearly 6,000*l.*, to form a trust-fund for scientific purposes; the late R. C. Carrington's bequest of 2,000*l.*; Mr. Direks's, of 878*l.*; and the bequest of Sir Charles Wheatstone, of 500*l.* to the Donation Fund founded by Wollaston for scientific purposes; the gift of Mr. Jodrell, of 6,000*l.*, for the "encouragement among our countrymen of original research in the physical sciences"; and the proposal of Government to add, by way of experiment, during five years, 4,000*l.* annually to the yearly grant of 1,000*l.*, which the Society administers for the Treasury chiefly in "providing investigators with instruments and assistance" of the Council, which may occasionally include "personal allowances or grants of money." Dr. Hooker next explained the course taken by the Council of the Society in the matter of the Vivisection Bill, and their "earnest remonstrance" against "the admission into the statute book of a principle essentially antagonistic to the progress of all natural knowledge." With reference to the Loan Collection of Scientific Instruments, it was remarked that among the advantages which would accrue from a permanent museum of such instruments would be "the saving of time and labour to investigators, assisting teachers, informing constructors of philosophical apparatus of the form in which reproductions are wanted, and possibly the lending of instruments to investigators under suitable restrictions." The medals were afterwards presented.

**New Recreation Grounds in Northampton.**—The *Northampton Herald* understands that the plans prepared by Mr. Wm. Hull, architect, are under consideration for establishing recreation grounds in the rear of Mr. Mulliner's premises, and to the south of the new Midland Station. The proposed gardens will be laid out to have one large central lime-tree avenue, with statues and vases, and central fountain. There will be side paths, and an outer ring for foot racing. Archery grounds, large bowling-green, swings, bars, and giant strides, are to be provided. Shrubberies and avenues arranged for seats and tables in recesses will be connected with the north and south paths. A large central promenade, with circular paths, and benches to rear of same, will surround an orchestra. A new summer skating-rink, 140 ft. long, by 40 ft. wide, surrounded on two sides by flower borders, and lighted up for evening performances by large globe lamps, will be constructed at the west end. There will be a raised covered promenade on one side of the same, leading to and communicating with the present winter rink; and a large building for gymnasium, 120 ft. by 40 ft., with dressing-rooms and baths, and fitted with appliances, after the manner of the new gymnasium at Rugby School, is proposed to be erected in the rear of the summer rink. A large double refreshment-bar is to be put up, to serve both rink and grounds. The principal entrance will be from the Midland-road—a little to the west of the Midland Station—and there will be another entrance from the proposed new road to the Cattle Market, to the east of the Midland Station.

**Pall-mall and Wood Paving.**—At a meeting of the St. James's Vestry, on the 28th ult., the subject of paving Pall-mall with wood arose, and it was moved that a letter be written to Captain Bulkeley, who had communicated with the Vestry as the representative of the inhabitants of Pall-mall, notifying that the Vestry were prepared to undertake the laying down of a wooden pavement from east to west, i.e., the entire length, conditionally upon the owners and residents agreeing to subscribe one-half the cost of the work. This motion having been seconded, an amendment was proposed to the effect that the Vestry would lay down a wood pavement if the inhabitants would undertake the entire amount of the first outlay (which it is understood would not be less than 6,000*l.*), the Vestry afterwards keeping it in repair. On a division, after a long discussion, the amendment was carried by one vote, 16 to 15.

**"Art in the Community."**—This was the title of a lecture recently delivered before the members of the Royal Birmingham Society of Artists, by Mr. J. Thackray Bance, F.S.S., who gave a retrospect of the progress of art during the last forty years, and compared favourably our present position with that which we then unfortunately occupied. He advocated a system of loans from the British Museum and the other great metropolitan repositories of art to the various museums and galleries in local towns, which were unfavourably treated in comparison with London. The art institutions of the metropolis were founded and fostered by national grants and without expense to the local government, whereas the same institutions in the country were almost entirely reliant on the generosity of private individuals. The rate for which provision could be made was so limited, and the claims of literary education had so much pre-eminence, that no public fund was left for the support of art. The rate of a penny in the pound, which was at first all that was required, ought now to be extended to enable those communities which were willing to provide the means of art education so much needed in manufacturing towns.

**North of England Institute of Mining Engineers.**—We understand that the long-projected desideratum of a Royal charter for the North of England Institute of Mining and Mechanical Engineers has at length been obtained. The idea was first mooted by Sir George Elliot, bart., while president of the Institute; and Sir George gave expression to it in his inaugural address. It was, however, not received at that time with much favour; but the advantage which a charter would give was seen and appreciated by Mr. Bunning, the secretary of the Institute, who has lost no opportunity of forwarding the idea, and now it has become an accomplished fact. It may be said that scarcely any society has started with higher resolves, and has so persistently worked to carry them out, than has this Institute; and it is satisfactory to be able to add that its efforts have been appreciated, for its members have increased to nearly 1,000 in number, and include nearly all the leading mining engineers in England and the Continent.

**The Agricultural Hall, Wolverhampton.**—Extensive alterations have been made at the Agricultural Hall, Wolverhampton, in order to provide a more commodious room for holding concerts and musical entertainments than has hitherto been provided in Wolverhampton. The large hall will accommodate about 2,000 persons. The orchestra spans the whole of the east end of the building, and will accommodate a band and chorus of 300 performers, and, if required, may be extended, by the removal of a portable screen, to admit of the erection of an organ and an increase in the number of performers. The space underneath the orchestra is fitted up with reception, dressing, and waiting rooms. The acoustic properties of the room have been tested by the members of the Festival Choral Society, and declared most satisfactory. The entire cost of the alterations amounts to about 2,000*l.*

**Friendly Societies and Trade Unions.**—The first part of the Friendly Societies and Trade Unions Report for 1875 was issued on the 28th ult. The number of friendly societies registered was smaller than during the previous year, which itself was below the average. This is accounted for by the fact that legislation was pending during both years, a cause which always checks the formation of new societies; and although industrial and provident societies, trade unions, and loan societies were not included in the Friendly Societies Bill of 1875, still the anticipation of fresh legislation in respect to both classes of bodies, arising from their inclusion in the original Bill of 1874, had no doubt the same effect in diminishing the number registered. A very considerable increase is, on the other hand, observable in the number of Building Societies incorporated under the new Act.

**Gun Cotton for Fog Signals.**—A fog signal has been established near the north-west end of Heligoland, on the summit of the land, which is 165 ft. above high water, wherefrom during foggy weather will henceforth be produced, by the explosion of gun-cotton, a report similar to that of a gun, every fifteen minutes. This, the first employment of gun-cotton for signalling purposes by the Trinity House, is likely to open a new era in the history of coast warnings.

**Asserted British Village in Oxford.**—A discovery had been made in the course of preparing the ground for the New University Schools in the High-street, Oxford, which are about to be erected from the designs of Mr. Graham Jackson, M.A. In proceeding with the excavations there has been laid bare the site of what is considered by some an undoubted British village, or settlement, dating back, perhaps, more than 2,000 years. The site chosen for the erection of the schools, and on which this discovery has been made, was occupied, as is well known, by the Angel Hotel, and lies between High-street on the north, Merton-street on the south, University College on the west, and King-street on the east, and embraces an area of about two acres. Some, whose opinion is entitled to consideration, attach much less importance to the discovery.

**Society of Engineers.**—At a meeting of Society of Engineers held on Monday evening, December 4th, in the Society's Hall, 6, Westminster-chambers, Victoria-street, Mr. V. Pendred, president, in the chair, a paper by Mr. William McNaught, on the "Rolling of Ships," was read by the Secretary. The author observed that lifting or drifting could not be prevented, but rotation could be controlled to a great extent, by the use of one or two balanced rudders, under the bottom of the ship, so constructed as to be withdrawn into the ship when not wanted, or when in shallow water. These steadying rudders were proposed to be worked by an attendant, who would turn them, so that their inclined surfaces would always be acting in opposition to the angular motion of the ship.

**Patent-Law Reform.**—A petition is now being circulated for signature by the Society of Arts. It is identical in terms with one that has already been presented to the Lord Chancellor by the council of the Society. The memorialists humbly pray his lordship "to cause the provisions of the Act of 1852 to be put into force by the appointment of one or more additional Commissioners of Patents, to whom might be entrusted the fully carrying out of the duties of the office, and who should be responsible for the same, and that no further legislation be attempted until after such Commissioners shall have been appointed, and the system contemplated by the Act administered in its integrity."

**South Yorkshire Asylum, Wadsley.**—Operations have been commenced for the erection of two large blocks of additional buildings to the Asylum at Wadsley. It is only about four years since this large establishment was completed, and already the justices find it necessary to increase the accommodation for both male and female patients by at least two-thirds. Mr. Bernard Hartley, the West Riding surveyor, who designed the original buildings, has prepared the plans; and Mrs. Neill & Sons, of Manchester, who carried out the works under Mr. Hartley, have been employed to execute the additions.

**Cumberland and Westmoreland Antiquarian and Archaeological Society.**—The next meeting of this society will be held in the Museum at Kendal, on Monday next, the 11th inst. Two days will be taken up by the reading of papers on local and other subjects, the more important being on "Roman Roads and Agricola's Line of March," by Mr. Richard S. Ferguson; "Saxon Crosses," by Canon Knowles, M.A.; "The Maunds," by Mr. G. Bellasis, Bluemantle; "Some Roman Remains," by Mr. William Jackson; "Kendal Parish Registers," by Mr. G. E. Moser; "Extracts from Kendal Records."

**Martin's Anti-Fouling Composition.**—This composition, patented by Mr. John Martin, is for preventing the fouling of iron ships' bottoms, and preserving iron and wood work generally. Some good testimonials in its favour have reached us. The composition has been under test during several sea voyages for a considerable time with perfect success, it is stated. It seems to us that it is especially advantageous for preserving harbour and pier works, whether of wood, stone, or iron, and in all situations exposed to alternations of air and water.

**The Bideford Bells.**—Messrs. Mears & Stainbank say it is not correct that the fine old peal of bells at Bideford, made by their predecessor, A. Rudhall, has been recast by Messrs. Abbott, of that town, and that the only cracked bell, the fifth in the peal, was recast by them in May last. On inquiry we learn that the bells cast by Messrs. Abbott were two new ones, to increase the peal, and that they rehung the whole in a new cage.



**Proposed New Cemetery at Morningside, Edinburgh.**—It is stated that steps are about to be taken by the Metropolitan Cemetery Company for the formation of the cemetery for which they recently acquired ground at Plewlands, Morningside. The site in question is an area thirty-two acres in extent. The suitability of its soil for the purpose of interment has been duly certified by Dr. Littlejohn and Mr. Buchanan, C.E., and the latter gentleman has been engaged in preparing a plan for laying out the ground.

**Bristol and Gloucestershire Archaeological Society.**—A general meeting will be held in Bristol, on Wednesday, December 13th. A paper on the Origin of Bristol will be read by the Hon. and Right Rev. Bishop Clifford. Mr. G. T. Clark, F.S.A., of Dowlais, will give an account of the recent visit of the Society to Berkeley Castle, and will point out the relations of that very curious structure to the early castles of England.

**Lewes Castle.**—The work of thoroughly overhauling the exterior of Lewes Castle has been recently entrusted to, and successfully carried out by, Mr. H. Fold, of St. Ann's. It was executed by a man suspended in a cradle. The northern part of the northern tower was found to be very much dilapidated, as well as one of the turrets of the Barbican, showing that the work had been delayed quite long enough.

**The Darlaston Nut and Bolt Makers.**—A dispute has arisen between Messrs. Archer & Sons, nut and bolt makers, Darlaston, and their men, and the association to which the latter belong, after censuring the conduct of the masters, have decided to call their members out if they are not paid extra wages for dressing up larger nuts than those specified in the lists.

**Proposed Cathedral for Liverpool.**—A correspondent, "F. B.," urges that in the event of a cathedral being required for Liverpool, we could not do better than carry out Wren's original design for St. Paul's, of which his model remains. We cannot endorse his suggestion. "Let the dead past bury its dead." We must give the "living present" a chance.

**English v. Belgian Girders.**—Some North of England firms, it is stated, have turned their attention to the manufacture of girder iron, such as is required for building purposes. It is to be hoped they will do a good trade, for much of the iron of this class used in England has of late been imported from Belgium.

**Arbitration in the North.**—The executive committee of the Durham Miners' Association and the coal-owners of that district have jointly appointed a barrister, with a salary of 300l. a year, to sit as an independent person to hear evidence upon any dispute that may occur between employers and employed.

**A Large Telescope.**—The gigantic telescope at the Paris Observatory, for which M. Bischoffheim made a gift of 26,000 francs, has been completed. On account of its dimensions a new building had to be prepared for it.

**Northamptonshire Sanitary Inspectors' Association.**—This Association recently held a quarterly meeting in Northampton, when Mr. Haviland, Medical Officer of Health and President of the Association, delivered an exhaustive address on the Rivers Pollution Bill.

**The Corn Exchange, Stourbridge.**—At the monthly meeting of the Stourbridge Commissioners on the 27th ult., it was resolved to proceed with the erection of new buildings, and to adopt plans by Mr. James Allsop, jun.

**The Wrexham Art Exhibition.**—The Wrexham Exhibition is now closed. It is estimated that 80,000 persons visited the exhibition; but this number failed to produce an adequate financial result.

**Royal Architectural Museum and School of Art.**—The Goldsmiths' Company have voted 100l. towards the special fund in aid of the classes for drawing and modelling at the Architectural Museum, Westminster.

**The St. Pancras Iron Work Company** have issued a new edition of their useful catalogue of stable-fittings to which we may fairly call attention, as it contains many new inventions and important improvements in this class of work.

## TENDERS

For the erection of new school buildings, with fittings, offices, and fences for the Aberdare School Board, Abernaut, Glamorganshire. Mr. E. H. Lingen Barker, architect:—  
Morgan (accepted) £1,900 0 0

For Bromyard sewerage. Mr. T. Curley, engineer.  
Quantities supplied:—  
Dowell £3,950 0 0  
Cordry & Sons 2,284 0 0  
Law 2,197 0 0  
Welsh 1,933 0 0

For alterations and additions to the Blue Bell Hotel, Scunthorpe, for Mr. R. J. H. Parkinson. Mr. Ernest W. Farebrother, architect:—  
Juke (accepted) £2,566 0 0

For alterations and additions to the house, and building new stabling, &c., at Southfield, Lough, for Mr. Wm. Hyde, jun. Mr. Ernest W. Farebrother, architect:—  
Clarke & Son (accepted) £2,170 0 0

For alterations to 197 and 199, Commercial-road, for Mr. E. Handley. Mr. C. A. Legg, architect:—  
Pick £650 0 0  
F. & F. J. Wood 486 0 0  
Judd & Hawkins 459 0 0  
Moyle & Son 380 0 0

For building four houses and one shop in Bedford-street, Mile End, for Mr. Mardorf. Mr. C. A. Legg, architect:—  
F. & F. J. Wood £1,643 0 0  
Atherton & Latta 1,500 0 0  
Judd & Hawkins 1,493 0 0  
Thorpe 1,240 0 0

For new warehouse, Milton-street, London:—  
Manley & Rogers £6,429 0 0  
Newman & Mann 5,888 0 0  
Ashby, Bros. 5,695 0 0  
Downes 5,616 0 0  
Linsell & Son 5,254 0 0  
Kiddell & Son 5,245 0 0

For the restoration of South Mills, Blunham, Bedfordshire. Messrs. Raynes & Shum, architects:—  
Langmead & Way (accepted) £4,031 0 0

For local board:—  
Watts £1,655 0 0  
Sapp 1,695 0 0  
Jackson 1,579 0 0  
Pizzev 1,530 0 0  
Neves 1,500 0 0  
George 1,459 0 0  
Nowell & Robson 1,415 0 0  
Rowley 1,049 0 0

For making up Priory-road, South Park, for the Reigate Town Council:—  
Rigby £312 0 0  
Husband 413 0 0  
Pizzev 395 0 0  
Pitt 391 0 0

For paving the floors of St. Olave's Wharf, Pickle Herring-street, Tooley-street, with 1½-in. asphalt flooring:—  
The Brunswick Rock Asphalt Co. (accepted).

For Messrs. Gibbs & Company's New Seed-crushing Mills, Burdett Wharf, Limehouse:—  
The Brunswick Rock Asphalt Co. (accepted).

For alterations to the City Arms, West-square, Southwark, for Mr. J. C. Ring. Mr. John Viney, architect:—  
General Alterations.

Beale £903 0 0  
Downs 897 0 0  
Blake 893 0 0  
Atherton & Latta 715 0 0  
Shurmer (accepted) 693 0 0  
Wilson 693 0 0

New Counter.  
Godden £70 0 0  
Taylor 60 10 0  
Hill (accepted) 43 0 0

Peutering.  
Edwards £58 17 4  
Heath 63 0 0  
Warne (accepted) 59 10 0

For building three cottages at Hackney Wick, for Mr. R. Colman. Mr. John Viney, architect:—  
Shurmer £990 0 0  
Downs 989 0 0  
Whiter & Young 800 0 0  
Atherton & Latta 735 0 0  
Godden 670 0 0  
Hooper (accepted) 630 0 0

For alterations to the Prince of Wales, East-road, City-road, for Mr. J. Elston. Mr. John Viney, architect:—  
General Alterations.

Atherton & Latta £237 0 0  
Shurmer 332 0 0  
Staines & Son (accepted) 347 0 0  
Adams 293 0 0

Fittings.  
Taylor £190 0 0  
Hill (accepted) 167 0 0  
Shurmer 144 0 0  
Brewer 118 7 6

Peutering.  
Edwards £130 5 0  
Heath (accepted) 95 0 0  
Saunders & Co. 88 10 0

For alterations to the Perseverance, Southgate-road, for Mr. J. Kendall. Mr. John Viney, architect:—  
General Alterations.

Hill £734 0 0  
Godden 225 0 0  
Francis (accepted) 129 0 0

Painting, &c.  
Hackett £115 0 0  
Sparks (accepted) 82 4 6

Peutering.  
Padden £59 10 0  
Heath (accepted) 49 10 0

For alterations to the King's Arms, Peckham-rye, for Mr. N. Wakley. Mr. John Viney, architect:—  
New Stables.

Downs £257 0 0  
Whitby 213 0 0  
Shapley 212 0 0

New Counter, &c.  
Downs £139 0 0  
Shapley 125 0 0  
Whitby 90 0 0

For house and baker's shop adjoining Holly Inn, Jamaica-level, Bermondsey, for Mr. I. J. Scotts. Mr. Geo. Trencher, architect:—

Downs £1,100 0 0  
Battley 850 0 0  
Wheeler 747 0 0  
Cane & Creba 550 0 0

For alterations and additions to No. 40, High-street, Marylebone, for Mr. H. Broadbent. Mr. Thos. Durrans, architect:—

Gould & Brand £338 0 0  
Taylor & Son 317 0 0  
Edgar 308 0 6  
Henderson 306 0 0  
Ashwell & Stevenson (accepted) 265 0 0

For the erection and entire completion of a new manufactory, for Mr. Chas. Nosotti, on the site of St. Anne's schools, Rose-street, Soho. Mr. Thos. Durrans, architect:—

Andrews £2,897 0 0  
Mark 2,777 0 0  
Ashwell & Stevenson (accepted) 2,697 0 0

For a section of works at the Royal Turkish Baths, Regent's Park. Mr. Thos. Durrans, architect:—  
Edgar £250 0 0

## TO CORRESPONDENTS.

R. R. W. (we do not undertake to supply our readers with valuations; take proper advice).—C. E. (a notice already in type).—G. I. (send us particulars).—S. & K.—W. C. G.—T. D.—J. V.—E. G. W.—T. D.—L. & W.—R. C. F.—R. C.—H.—R. H.—J. G.—R. G. B.—T. B.—G. F.—W. L.—T. P.—T. C.—J. H. S.—F. M.

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

NOTE.—The responsibility of signed articles, and papers read public meetings, rests, of course, with the authors.

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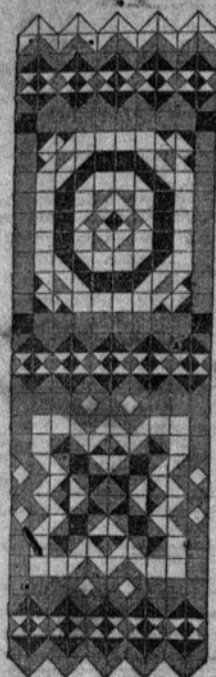
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### Battersea and its Park.

F the various improve-  
ments made of late  
years in the metro-  
polis few have been  
of greater value than  
that by which the  
wretched waste known  
as Battersea Fields  
was transformed into  
the beautiful Batter-  
sea Park. The fields  
had become a public  
nuisance when Mr.  
Thomas Cabitt, in  
1843, suggested to her  
Majesty's Commission  
for Improving the Me-  
tropolis the advisability  
of laying them out as  
pleasure-grounds, and  
this design was subse-  
quently pressed upon  
their attention by the  
Hon. and Rev. Robert

John Eden, afterwards Lord Auckland, and suc-  
cessively Bishop of Sodor and Man, and Bath  
and Wells. In 1846 an Act of Parliament was  
passed to empower the Commissioners of Her  
Majesty's Woods and Forests to form a royal  
park in Battersea Fields, and Mr. (afterwards  
Sir) James Pennethorne's plan was approved, by  
which 320 acres were to be enclosed, at an  
estimated cost of 154,250*l*. The fields were  
naturally very low, and they were, in fact,  
entirely overflowed by the river at high-water,  
until about 300 years ago, when an embankment  
was raised, and the land reclaimed. One of the  
first necessities, therefore, when the scheme of  
forming a park was entertained, was to raise the  
general level of the land, and fortunately at this  
time the extensive excavations for the Victoria  
Docks, in the Plaistow Marshes, were being  
proceeded with, so that there was no difficulty  
in obtaining the required loads of earth. The  
excavations from the St. Katharine Docks had  
been used in the same way, in 1827, to fill up  
the reservoirs of the Chelsea Waterworks, and  
thus form a site for a new town which  
grew up south of Pimlico. One million cubic  
yards of earth are said to have been deposited  
upon Battersea-fields from the Victoria Docks  
and other sources. This operation occupied  
several years, and there were great complaints of  
delay in carrying out the various proposals. In  
1851 another Act of Parliament was passed to  
alter and extend the powers of the one of 1846,  
by which a Commission, incorporated as the  
Battersea Park Commission, was appointed, with  
power to sell, demise, or lease lands not required  
for the park. Still the works did not proceed  
very rapidly, and little was done before 1855 or  
1856; then the drives and walks were laid out,  
and the ornamental water formed. The planting

commenced in 1857. On March 28, 1858, the  
Chelsea Suspension Bridge was opened, by which  
the park was made easily accessible to the  
dwellers on the north side of the Thames, but  
great public dissatisfaction was expressed when  
it was found that a toll was to be exacted. By the  
formation of mounds and banks several acres  
were reclaimed along the sides of the river, and  
the total acreage of the park was about 200,  
rather less than was at first proposed. The park,  
besides the ordinary features which it has in  
common with its fellows, possesses a sub-tropical  
garden of four acres, that has been proved to be  
one of the most successful efforts of out-door  
gardening in modern times. Here the East and  
West Indies, Japan, South America, and Aus-  
tralia, all send their contingent, and the graceful  
foliage of warmer climes is brought to gladden  
the eyes of those used to a more northern flora.  
Every year adds to the beauty of the park, for  
the trees increase in height, and the shrubs in  
denseness; so that, as less is seen at one time,  
the sensation of size is increased. Such is the  
change that thirty or forty years have made in the  
once miserable expanse which was given over  
every Sunday to the low amusements of the  
dangerous classes, and was at one time con-  
sidered a fit rendezvous for the duellists. Here,  
on March 21, 1829, the Duke of Wellington and  
the Earl of Winchelsea had their celebrated  
hostile meeting. Still, in spite of their bad  
name, the old fields had their admirers, who  
loved to seek in them for the abundant wild-  
flowers. A learned botanist in the last century  
compiled a flora of Battersea, and many of the  
plants that luxuriated in these fields were not to  
be met with elsewhere, except at places much  
farther from London. The noted place of enter-  
tainment called the Red House stood nearly  
opposite to Chelsea Hospital. It was a favourite  
resort for the lovers of shooting-matches.  
Pigeons were there sold (to be shot at) at 15*s*.  
a dozen, starlings at 4*s*., and sparrows at 2*s*.

Battersea has a history of some interest,  
dating from the time when the manor was in  
the possession of Harold. At the Norman Con-  
quest it passed into the hands of William the Con-  
queror, who exchanged it with the Abbey of St.  
Peter at Westminster for lands at Windsor. We  
have no earlier record of the name than that in  
Domesday Book, where it appears as *Patricsey*;  
and as Petersham, which belonged to St. Peter's  
Abbey, Chertsey, is there spelt *Patricesham*, it is  
supposed that the earliest form of Battersea  
originated in the connexion of the place with  
St. Peter's Abbey. The *c* in both these words  
was sibilant, and therefore the pronunciation  
could not have been very different from what it  
is now, but it is a curious anomaly that the *p* in  
*Patricsey* should have changed into *b*, while that in  
*Patricesham* has continued unchanged. What the  
final syllable represents is less clear, as there  
is no sign of an island at Battersea now,  
although there may have been once. Chelsea  
was originally *Cealc-hythe* or *Chelc-hythe*, and  
a haven on the Thames, not an island, just  
as Lambeth was "*Lambe-hithe*," or haven;

but there is no recorded form of Batter-  
sea that would allow us to say that *ey* or *ea*  
represented *hithe*. There was, however, until  
about thirty years ago, a creek, up which tradi-  
tion reports that Queen Elizabeth rowed. A  
bright little stream rising in Tooting, and passing  
by Wandsworth Common, flowed into the Thames  
at this creek, which is now a mere sewer, and its  
better character is only kept in remembrance by  
the name of Creek-street.

The manor of Battersea, which had remained  
in the possession of the Westminster monks for  
several centuries, was vested in the Crown at  
the period of the dissolution of the monasteries.  
Elizabeth, in the eighth year of her reign,  
granted it on lease for twenty-one years to  
Henry Roydon, and in 1593, Joan Holcroft, the  
only daughter of Henry Roydon, had another  
lease for a similar term. Subject to this lease,  
the manor was assigned in 1610 towards the  
maintenance of Henry Prince of Wales, and  
after his death it was appropriated in the  
same manner to his brother Charles, Prince  
of Wales. After Charles's accession to the  
throne, the manor was granted, in 1627,  
in fee, to Sir Oliver St. John, Viscount Grandi-  
son, a friend of the Duke of Buckingham, who  
had filled the office of Lord Deputy of Ireland,  
and in his family it remained for nearly 150  
years.

In the reign of Henry VI. Thomas Lord  
Stanley possessed a considerable estate in Bat-  
tersea, which, apparently to avoid its confisca-  
tion at that disturbed period, he conveyed to  
trustees for his own benefit and that of Thomas,  
his son and heir. In December, 1460, the  
trustees transferred this property to Lawrence  
Booth, bishop of Durham, and his heirs, and in  
the following year the grant was confirmed by  
the two Stanleys. In spite of this transfer the  
estate had escheated to the Crown before the  
eleventh year of Edward IV., in consequence of  
the action of John Stanley, who assigned the  
lands and tenements in trust to the Abbot  
of Westminster, in contravention of the  
Statute of Mortmain. The bishop, therefore,  
had to apply direct to the king, and on payment  
of 700*l*. he obtained a grant under letters patent,  
dated July 10, 1472, of the property forfeited by  
John Stanley. He also received the king's  
licence to enclose his mansion-house, called  
Brygge-court, which he had built "with walls  
and towers, and to impark his land there, with  
the right of free warren and free chase therein."  
Bishop Booth was translated to York in Septem-  
ber, 1476, and prior to his decease, in May, 1480,  
he bequeathed this property to the Dean and  
Chapter of York, with a view to the accommoda-  
tion of his successors in the see, so that they  
might have a convenient residence when their  
affairs called them to London. There is a  
tradition that Wolsey lived here, and the room  
in York House was shown where he was supposed  
to have entertained Anne Balleyn, but it is  
little likely that the luxurious cardinal should  
have taken up his residence at Battersea while  
he possessed a more convenient palace at West-



minster. When Archbishop Holgate was committed to the Tower by Queen Mary in 1553, the officers who were employed to apprehend him, rifled his house at Battersea, and took away from thence "300*l.* of gold coin, 1,600 *oz.* of plate, a mitre of fine gold, with two pendants set round about the sides and midst, with very fine pointed diamonds, sapphires, and balists; and all the plain with other good stones and pearls; and the pendants in like manner, weighing 125 *oz.*; some very valuable rings, a serpent's tongue, set in a standard of silver gilt and graven; the archbishop's seal in silver; and his signet, an antique in gold." He was deprived of his see in the following year, because he was a married man.

By a special clause in the lease of the person who farmed the York estate, four score acres of land were reserved to be surrendered to the Archbishop to use as demesne lands at a month's notice, whenever he should be resident at Battersea or within sixty miles of that place. This clause was systematically infringed, and the archbishops were unjustly deprived of their rights. Archbishop Grindal had a successful suit with the farmer, and leased the estate to a new tenant, but when he was translated to Canterbury he did not give up the property to his successor. Among the State Papers is a letter dated August 22, 1580, from Archbishop Sandys to John Wickliffe, keeper of his house at Battersey, in which he directs him to deliver up the house to the Lords of the Council, so that it might be turned into a prison for obstinate Papists. During the Commonwealth York House was sold to Sir Allen Apsley and Colonel Hutchinson for the sum of 1,806*l.* 3*s.* 6*d.*, but it was reclaimed by the see after the Restoration. The remembrance of the connexion of the Archbishops of York with Battersea is kept alive by the name of York-road.

We will now return to the consideration of the successive possessors of the manor. Oliver Lord St. John and Viscount Grandison died in 1630, when his English title became extinct, and that of Grandison descended to his grand-nephew, William Villiers, father of the notorious Duchess of Cleveland. The Battersea estate also came into the hands of Villiers, who granted it to his cousin Sir John St. John, bart., who died in 1648. It then fell to Sir Walter St. John, the nephew of Sir John. He died on July 3, 1708, and was succeeded by his son Henry, who so long before as 1684 had pleaded guilty to the murder of Sir William Eatcourt, bart., in a sudden quarrel arising at a supper party. In 1716 the above-named Henry was created Baron St. John of Battersea and Viscount St. John, with remainder to the issue male of his second wife. His eldest son by his first wife was then under attainder, and the titles so descended on his death in 1742. Henry St. John, the celebrated statesman, was born at Battersea, and baptised there on October 10th, 1678. In 1710 he was Secretary of State to Queen Anne, by whom, in 1713, he was created Baron St. John, of Lediard Tregoeze, in Wiltshire, and Viscount Bolingbroke, with remainder, in default of male issue, to that of his father. On the accession of George I., in 1715, he was attainted for high treason; but in 1723 he was restored in blood, and in 1725 an Act of Parliament was passed to annul the attainder, in consequence of which he inherited the family estate on the decease of his father, and he held it until his death in 1751. The estates with the titles descended to his nephew Frederick (son of his half-brother, John Viscount St. John), who obtained an Act of Parliament in 1762, to sell his estate, which was purchased in 1763 by the trustees of John, Earl Spencer.

As the place of his birth, Lord Bolingbroke is supposed to have been peculiarly partial to Battersea, and he expressed the wish that he might breathe his last in the house of his ancestors there, which wish was accomplished. Bolingbroke House was a large mansion, situated near the church, which was mostly pulled down in the year 1777. Bolingbroke-gardens and Bolingbroke-terrace mark the site. Pope's "Essay on Man" is said to have been partially written in a room wainscoted with cedar, which overlooked the Thames, and was the poet's favourite study. Lord Bolingbroke's second wife was the widow of the Marquis de Villette, and the niece of Madame de Maintenon. She died on the 18th of March, 1750, the year before her husband. In Battersea Church is a monument to their memory by Roubiliac, on which is

a highly laudatory inscription, commencing "Here lies Henry St. John, in the reign of Queen Anne Secretary of War, Secretary of State, and Viscount Bolingbroke; in the days of King George the First and King George the Second something more and better." It is also stated of the Viscountess that "she lived the honour of her own sex, the delight and admiration of ours; she dyed an object of imitation to both, with all the firmness that reason, with all the resignation that religion, can inspire."

The present church at Battersea was built according to Act of Parliament (14 Geo. III.), and was opened on the 17th of November, 1777. There is a river view of Battersea by Boydell, which shows the old church as it stood in 1752. When the old building was pulled down care was taken to preserve the monuments and the stained glass, which were re-erected in the new one. Besides the Bolingbroke monument already noticed, there are other memorials of the St. John family, and a curious monument to Sir Edward Wynter (died March 2, 1685-6, aged 64), who, according to the inscription in his honour, outstripped the actions of the boldest knights of chivalry. Unarmed he crushed a tiger to death, and on foot he routed forty mounted Moors.

"What more could Samson do?  
True to his friends, a terror to his foes,  
Here now in peace his honor'd bones repose!"

The stained-glass window which was removed from the old church to the new contains portraits of Henry VII., his grandmother, Margaret Beuchamp, and Queen Elizabeth, but the work is not of early date. The new church is a brick building, with an octagonal spire, and about the year 1823 an entrance portico of the Doric order was added to it. The elder Charles Mathews said that Battersea steeple being of copper was coveted by the Emperor of Russia for an extinguisher, and that the horizontal windmill (which was erected about 1788 on the site of Bolingbroke House) was a case for it. His Imperial Majesty intended to take them with him, but left them behind from forgetfulness. The church is far from handsome either within or without. It has neither aisles nor chancel, and the communion-table is placed in a recess at the east end; the pews are of the old-fashioned regulation height. A little girl, who was taken to church for the first time, complained that she had been shut up in a closet and sat upon a shelf, which is not a bad description of these antiquated abominations.

The parish register records the burial of Arthur Collins, author of the well-known "Peerage," in 1760; of William Curtis, author of "Flora Londinensis," in 1799; and of Thomas Astle, author of the "Origin and Progress of Writing," in 1803. In 1648, Sir John St. John was buried at Battersea with such unusual pomp that the heralds were flattered, and commenced a prosecution against the executor for acting contrary to the usage of arms and the laws of heraldry. William Riley, one of the heralds, deposed "that the funeral of the deceased was conducted in a manner so much above his degree that the escutcheons were more than were used at the funeral of a duke; and that he never saw so many pennons but at the funeral of one of the blood royal." This burial is omitted in the register.

About 1159 Lawrence, Abbot of Westminster, obtained the appropriation of the great tithes for his monastery, out of which the monks were to receive two marks, and sufficient was to be reserved to support the vicar. In the reign of Philip and Mary the rectory was held by John, Bishop of Winchester, and it was granted by Queen Elizabeth in her twenty-third year to Edward Downing and Peter Ashton. The rectory afterwards came into the possession of the St. John family, and passed with the manor to Earl Spencer.

Owen Ridley was instituted to the vicarage of Battersea in 1570, and appears to have encountered considerable persecution from his parishioners for several years. Some of them petitioned Dr. Swale, one of the Ecclesiastical Commissioners, that the vicar might be deprived of his cure, one of his chief crimes being that of conversing with a witch. Others presented a counter-petition to Lord Burghey, which was signed by Robert Cooke, Clarencieux king of arms. Thomas Temple, brother of Sir John Temple, Irish Master of the Rolls, was vicar during the Commonwealth, and was also one of the Assembly of Divines. He was succeeded by the learned Dr. Simon Patrick, afterwards rector of Covent-garden, dean of Peterborough, and successively bishop of Chichester and Ely.

Battersea Bridge, one of the structures which long offered a serious hindrance to the navigation of the Thames, was built in 1771 and 1772 in accordance with an Act of Parliament (6 Geo. III., cap. 6) which was obtained when John Earl Spencer expressed his wish that a bridge should replace the ferry, of which he was the owner. It was built by Holland, at the expense of fifteen proprietors, each of whom subscribed 1,500*l.* Within the last few years iron girders have been introduced in order to enlarge some of the arches.

Formerly the largest portion of the land at Battersea was occupied by the market gardeners, and the produce of the fields was in considerable repute. Fuller, writing in 1660, says,—"Gardening was first brought into England for profit about seventy years ago, before which we fetched most of our cherries from Holland, apples from France, and had hardly a mess of rath (i.e., early) ripe peas but from Holland, which were dainties for ladies, they came so far and cost so dear. Since gardening hath crept out of Holland to Sandwich, Kent, and thence to Surrey, where, though they have given 6*l.* an acre and upwards, they have made their rent, lived comfortably, and set many people on work." (Worthies.) Now the builder is rapidly encroaching upon the fields and the hedges, and ditches are fast disappearing. By an old custom of the manor, lands descended to the younger son, and in default of sons were divided equally among the daughters. An Act of Victoria, however, annulled such local customs. There is little more to add to this description of Battersea, except to mention the factories for which it has long been noted. The English enamels formerly made here are now much sought after. Sir Marc Isambard Brunel's celebrated saw and veneer mills were burned down about the year 1814.

The chemical and other works that have found here so convenient a location are not altogether looked upon with favour by the other inhabitants. And it is supposed that they contaminate the air and injure the condition of the sewers.

#### ART IN ORNAMENT AND DRESS.

An attempt to lay a foundation for style and taste in dress upon the ground of general principles common to all the non-phonetic arts, and thus to connect the architecture of costume with the more permanent forms of decorative structure, has a degree of novelty in it. This is what is attempted in the treatise of M. Charles Blanc,\* which originally appeared in the shape of serial articles in the *Gazette des Beaux Arts*, and is now published in a separate form. No translator's name is appended to the English edition, which is not written in the best possible style, and betrays confusion in the transmuting of French idiom into English here and there, even without comparison with the original; however, like Mercutio's wound, "tis enough,—'twill serve": it makes a very agreeable book, and an undeniably suggestive one.

We begin, with M. Blanc at the very beginning—general laws of ornament: "repetition, alternation, symmetry, progression, and confusion": illustrated in the first instance by sketches of typical forms of architectural detail, which, to say truth, are by no means well rendered. The section which has the most important bearing on what follows is that on "symmetry," since that quality, in its conventional sense of a likeness between two halves on either side of a centre line, is peculiarly illustrated in the figure, which is the basis of costume. The author, like some other critics, overdraws the relation between architecture and the figure in this respect, as in saying, for instance, that a temple having its principal entrance in a corner of the building would seem to us outrageous, "because its façade would bear no resemblance to the aspect of the human face." That is not the way to put it at all, for we know that a principal entrance may be placed at the angle of a building with very fine effect: the correct statement would be that a building symmetrical in all other points would lead us necessarily to expect symmetry in so important a feature as the placing of the doorway. Still more incorrect as to fact is his statement, in illustration of the need for symmetry felt by artistic nations, that "the Athenians, the better

\* "Art in Ornament and Dress." Translated from the French of Charles Blanc, Member of the Institute, and formerly Director of Fine Arts. With illustrations. London: Chapman & Hall.



to mark the central point of the Parthenon, took care that the space between the middle columns should be wider than between the others, while to right and left of the door the columns were closer and closer together." Where M. Charles Blanc got this from we know not. But he recognises the fact that symmetry is the highest law and realises the gravest and most dignified effect, and that departure from symmetry leads to a lighter kind of effect, to piquancy and picturesqueness, and that this principle is as much illustrated in dress as in architecture; though in both he seems disposed to lay too much stress upon symmetry, and to undervalue the effect of unsymmetrical grace, in ornament, as much as it is over-valued by the enthusiasts for Japanese irregularities at the present time. Among secondary qualities of interest in ornament the author rightly gives an important place to what he defines as "complication," the tendency of which is "to provoke the curiosity of the spectator and rouse him to an investigation which promises to be of interest." This is a most valuable element in ornament, not sufficiently recognised with us: it is what gives much of its interest to Saracenic ornament, and to such a design as that Roman mosaic pavement formed by interlocking circles, which has been copied in the Kensington Museum, and is so continually pleasing to the eye. Any ornament which displays what may be termed a "curious felicitas," which attracts the eye to consider how it is contrived, is sure to supply an element of interest.

In regard to the main object of his book, M. Blanc justifies the degree of attention he requests to the subject of dress and personal adornment, by the consideration of the superior beauty and interest of a living being over a lifeless object; and yet, while in a list of the decorative arts we find all honour paid to the jeweller, the glass manufacturer, &c., "we shall find no mention made of the man who invents a new style of dressing the hair, or of her who designs costumes and fashions." There is a certain truth in this also, only the interest we take in each other is not confined to appearances; and even a beautiful woman, if intellectual also, is valued by sensible people for her intellect more than for her beauty. We are quite at one with the author in thinking personal adornment, especially in regard to women, a beautiful art, and which deserves to be considered more directly in relation to general artistic principle than it mostly is, only do not let us exaggerate, and talk as if this outward adornment were as important in a man or woman as in an inanimate object, which is made simply for ornament and nothing else. Besides, it is a melancholy but undeniable fact, that we are not (even the fairer sex) all beautiful; it used to be said that a certain eminent philosophical writer, and his wife, and their favourite dog, were the three ugliest objects to be seen in London; and in such a case the treatment of man or woman as pre-eminently a work of art is beset with difficulty.

M. Blanc's remarks upon colour in dress, and its effects and affinities, are often brilliant and clever, and suggest new meanings and associations. Yellow striped with black characterises, he observes, the colour of the most formidable animals, and the most venomous insects,—the tiger, the panther, the wasp; "and this contrast of black and yellow is also much fancied in countries where the passions are hot and violent." Is, then, the liking for this strong vivid combination a taste connected in any way with a violent temperament? That might be going too far: it would, perhaps, be more correct to say that it is a taste nurtured in lands of brilliant sunlight, where feeble colours would seem weak and faded to eyes accustomed to the glare of yellow light. But the author thinks there is a sort of moral character in colours as well as a merely optical one. "Red has an expression of dignity, magnificence, and pomp. There is something imposing and terrible in the robe of a criminal judge." (Here we might ask, perhaps, which is cause in this case, and which is effect?) "The expression of blue is one of purity. It is impossible to attach to this colour the idea of boldness, licence, or voluptuousness. Blue is an unobtrusive and imaginative colour, which, recalling the impalpable ether and the clearness of the calm sea, necessarily pleases the poet by its immaterial and celestial character. . . . It is, moreover, of all colours that which ascends the highest, and descends the lowest in the scale of chiaroscuro. Nothing so much resembles white as light blue, and nothing so much resembles black as dark blue,—the blue

d'enfer, as dyers call it. The result is that this colour is more susceptible than others of approaching extremes, and thereby changing its character. It may be suitable in its light shade for the dress of an innocent maiden, and in its dark for romantic affections and evening thoughts. It seems in this latter case to indicate a mind which is beginning to withdraw itself from the realities of life, and to incline to solitude, mystery, and silence." That is pretty, but a little too fanciful; and the very name given by the dyers to the dark blue suggests what will have occurred to the reader, that this tone of colour may be menacing enough in its effect; just as, on the other hand, we can at this moment recall Vandyke portraits clad in light blue, which have an effect and expression anything but modest and retiring. But his suggestions on the echo of colour in dress are very good; for example, if the upper and under skirt are of two contrasted colours, such as pale blue and straw colour (a charming combination), "if the blue skirt is ornamented with a deep-plaited ruche, the sleeves of the straw-coloured tunic should have small blue plaitings," an effect of repetition both in colour and surface-treatment, which is illustrated in a very pretty colour-printed sketch; and he makes a hit in quoting the remark of a lady,—"It is possible to dream in a sky-blue bonnet, but it is absolutely forbidden to weep in a pink one!"

We like, also, M. Blanc's remarks on the element of dignity in dress, as opposed to too much complication and angularity of line, or even to over-richness. He dislikes the tartan exceedingly, for this reason; and we know that when Mr. Charles Mathews dresses for "Cool as a Cucumber," he can find nothing so suitable for the ultra-impudence of the character as a very large check pattern. M. Blanc points out that in Paolo Veronese's "Marriage of Cana," the magnificent figured stuffs are reserved for the musicians and cup-bearers, while the Virgin and Christ and those who are in the seats of honour are simply clad in woollen tunics of pure red and blue. "But is it not wonderful," he observes, "that the same principles which govern greater things rule also lesser, and that unity is a necessity of nobleness even in the most frivolous art, as well as the secret of greatness in the highest efforts of the human mind?" But in spite of these "most excellent sentiments," we must quarrel with M. Blanc for the want of this very nobility and dignity in the illustrations to his book. His figures of ladies, illustrating various qualities in the design of dress, are for the most part artificial and affected to a degree, and come very near to the mere *modiste* type. The detestable chignon is shown everywhere in all its repulsiveness. And there is not apparently the slightest recognition in his pages of the possibility of the picturesque of dress in an economical form; there is no place in his scheme of the art for those who cannot keep long milliners' bills; no suggestion of the possible beauty and character in combinations of homely materials for the poorer classes. This is a serious defect; and we fear the author's notions of the artistic lie too much on the surface. He says, in his chapter on personal ornaments, that "an object destined for use may be embellished but cannot be intrinsically beautiful, for if its chief characteristic is beauty, it is no longer suitable for use. Only a savage would put salt into Benvenuto's famous salt-cellar, or use a Panathenian amphora in offering wine to his guests." Such a remark is simply nonsense, and indicates a totally false idea of the relation of art to utility.

The chapter on jewels contains, however, some very good remarks: the author, while observing that jewelry, more than any other class of personal ornament, should be governed by symmetry of arrangement or design, points out how unsuitable for this purpose is any design partaking too much of architectural character; and also urges that representations of the figure are out of place, as competing in interest with the real figure of the wearer,—turning what should be a subsidiary ornament into a predominant attraction. This may be more open to question, but we are inclined to agree with M. Blanc; jewels should not be pictures; they should preserve a purely ornamental character. He is quite right also in his admiration of the emblematic use of jewelry:—"In the earliest ages jewels were emblems. The gems worn by men and women bore the impression of profound sentiment, or contained some allusion to a religious idea." Symbolism, which is the bane of

the higher arts, finds its true field in this beautiful and fanciful branch of art, adding to the object a meaning and an interest beyond that excited by its value or its beauty of form or colour. While dwelling with evident pleasure on "these treasures of concentrated light and colour with which human beauty can adorn itself," M. Blanc does not allude to one characteristic of these adornments, their imperishable nature in comparison with that superior but transient beauty of which they are the appendages. An old English poet can supply the reflection, in words of equal grace and tenderness. Herrick exhorts a fair one not to be proud of those eyes "that sparkle star-like," nor of the effect of her charms,—

"Whence the ruby that you wear,  
Sunk from the tip of your soft ear,  
Will last to be a precious stone,  
When all your world of beauty's gone!"

A melancholy moral, certainly, which "must give us pause," were there not also another side to it.

But, in spite of certain deficiencies we have named, we recommend M. Blanc's pages to those who are interested in the art of personal adornment.

#### THE FRENCH ACADEMY.

On Thursday, November 30th, M. Charles Blanc, the well-known art critic and historian, the philosophic Vasari of France, was elected a member of the French Academy.

M. Charles Blanc's writings are well known in England, and, unlike most Frenchmen who have written about English art, he at least acknowledges some merit to our painters.\*

M. Charles Blanc has peculiarly qualified himself for an art critic, having devoted the whole of his life to the subject, commencing early as a practical artist in the *atelier* of the famous engraver Calamatta, and working by the side of Mercuri, to whom we owe the beautiful engraving of the "Moissonneurs." This *atelier* being constantly visited by the enthusiastic art *littérateurs* of thirty years ago, M. Charles Blanc imbibed at this time, not so much a distaste for the practice of engraving, as a strong love for the literature and philosophy of art, and he has admirably shown us, in his Grammar of Arts and Design, an interesting account of the psychological processes that have led to the creation of modern French art. Unlike our own great Ruskin, M. Charles Blanc has made no attempt to disturb long established reputations. His respect and veneration for the efforts of other men to realise their ideal has been thoroughly catholic. He must be excused, as all Frenchmen it appears must be, for an egoism which gives so preponderating an admiration for the art of his countrymen, and he evidently partakes, as all Frenchmen do, of that hopeless view of English art, classing our painters and sculptors with the possession of no more claim to style than they find in our dressmakers or our cooks.

His election to the French Academy appears to have been made an exceedingly novel and most unsuitable occasion for political discussion, but, really, when one thinks that politics and art are the only two subjects the Parisians seem to consider, we must not wonder that the election of M. Charles Blanc, the brother of the well-known Louis Blanc, to the membership of the Institute, should call forth some remarks from that numerous *clique* of Bonapartists and Legitimists, who appear still to permeate all societies.

The constitution of the Institute, as it is called, is somewhat complex in its construction, and from its earliest days there was an indecision in its regulations. Founded by Cardinal de Richelieu some ten years earlier than our own Royal Society, the Académie Française received on January 2nd, 1635, its letters-patent signed by Louis XIII. Founded a few years later (1648) the Academy of Painting and Sculpture, as it was then called, was, properly speaking, the oldest of all the French academies, for as early as the fourteenth century we find traces of the existence of an association of this nature, and the society of Saint Luc had existed some time previously. In 1655 the Society was definitely constituted by Cardinal Mazarin, and in 1671 the far-seeing minister Colbert instituted the Academy of Architecture. Founded in 1666, also by this minister, the Academy of Sciences only received the approbation of his royal master in 1699. The Academy of Inscriptions

\*The thin volume which treats of the English school in the great work of M. Charles Blanc is not from his own hand, but by his collaborator, M. Burger.



and *Belles Lettres* then followed, composed at its foundation in 1663 of four members chosen by Colbert; the business of this body was to prepare and write inscriptions for whatever monuments might be erected or medals struck in honour of their august master.

These four academies created in the seventeenth century, existed just as our English bodies of the same nature do at the present moment, each as a separate corporation, having no connexion with each other; and thus they continued to exist till the period of the French Revolution, which entirely broke up their constitutions, and formed, by their union, the body now called the Institute.

Suspected of monarchical sentiments, in 1793 the Académie Française was suppressed, but two years later was re-constituted, when, in 1795, the law of the 25th of October founded the modern Institute. In the beginning this was composed of simply three classes,—the Academy of Sciences; the class of moral and political sciences analogous to the present academy of the same name, and to a portion of that of the inscriptions and *belles lettres*; lastly, the third class, that of literature and the fine arts, embracing what we should now call the Académie Française, the Academy of the Fine Arts, and that of Inscriptions and *Belles Lettres*.

Once established, the Convention gave to the Institute the power of naming the forty-eight members, who were again to select the other ninety-six. By the law of 1796 it was decreed that the Institute should be composed of 144 members residing in Paris, of an equal number of associates chosen from the whole of the Republic, to whom may be added, as corresponding members, twenty-four foreign *savants*, eight to each class. When chosen, the Institute was installed in the Louvre.

Under the laws of 1795 and 1796 the Institute enjoyed much liberty, and hence it was that Napoleon, then First Consul, determined a change. In 1803 was passed a law by which the election of any member had to be approved by the head of the executive power. This arrangement is still kept up. A second article increased to four the number of classes, admitting this time history to a full share of honour; and separated more markedly the different other branches.

In 1806 the Institute, which since its commencement had borne the title of *Institut National*, took the name of *Institut de France*, but it was not till 1811 that it bore that of the *Institut Impérial*. This latter is now no longer in use, and it is again called the *Institut de France*.

The approaching days of the Restoration were, however, to bring mishap on the Institute, and during the first years of the Bourbon's reign the work of the Convention was erased and the old academies of Louis XIV.'s time were re-established. Henceforth the mere protection of the Duc de Berry or the Duc d'Angoulême sufficed to procure an entry to the Academy. Indeed, in 1816 no less than twenty-two members were expelled from the Institute, among whom were to be found the well-known names of David, La Rame, Siéyes, Monge, and Carnot. The Revolution of 1830 brought better days to the Institute, though the Government of Louis Philippe determined to leave to time the care of arranging the difficulties that had arisen. In 1832 M. Guizot, then Minister of Public Instruction, recreated the class of the moral and political sciences, giving thus a place to philosophy, to legislation, political economy, and statistics. For a long time, however, the spirit of sect pursued the elections to the Institute, and thus, we find, during the reign of Cousin over philosophy, none but those who entirely agreed with his views entered the sacred pale. From that time to this the Institute has enlarged both in science and reputation.

Thus, what is now called the Institute is composed of these five academies,—the French Academy, the Academy of Sciences, the Academy of Inscriptions and *Belles Lettres*, the Academy of Fine Arts, and the Academy of Moral and Political Sciences; these sit at the well-known building opposite the Louvre on the other side of the Seine, at the building called the Palais de l'Institut or the Palais Mazarin.

Of these, the Académie Française, of which M. Charles Blanc has just been elected a member, is composed of forty members (called popularly the forty *immortals*). They are nominated by election, and the candidates can alone arrive at the position by a personal solicitation, and after this their nomination is submitted to the chief

of the executive power, just as in England her Majesty gives her consent to the election of an Academician.

It may be remembered that one of the chief works of this Académie Française is the preparation of the famous Dictionary of the French Academy, the first edition of which appeared in 1694 and the sixth and last in 1835. Until the present century the French Academy, like the Della Crusca of Florence, confined its labours to the preservation of the language; since then, and for the last half-century, it has been opened to all comers in science and art.

The Academy of Sciences, which, at the Revolution, took the first place among the classes then instituted, is composed of sixty-five members, divided into eleven sections; each of these counts six members, with the exception of the geographical, which has only three; in addition to these there are two perpetual secretaries, ten free members, eight foreign associates, and a large number of French and foreign corresponding members.

The Academy of Inscriptions and *Belles Lettres* is composed of forty members and ten free members, its chief work being connected with history and archaeology.

The Academy of Fine Arts, which received its present name at the time of the Revolution, when the Academy of Architecture was added to it, is composed, like our own Royal Academy, of forty members; it is, however, divided into five sections,—painting, sculpture, architecture, engraving, and music. It is this academy which directs the various competitions, distributes the annual *grands prix de Rome* in the five sections, presents candidates for the post of professor to the schools of art, and in many other ways directs the fine arts of the country.

The Academy of Moral and Political Sciences, founded in 1795, was suppressed by Napoleon in 1803, nor was it till the reign of Louis Philippe, in 1832, that it was re-established, by the advice of M. Guizot. It is composed of fifty members, and is divided into five sections; in addition, there are five foreign associates, and a number of corresponding members.

In looking hastily over the Annuary of the Institut de France, we find the following distinguished Englishmen have been connected with the body. In the Academy of Beaux Arts, the first name is one very familiar to these pages, that of Professor Donaldson, a foreign associate since 1863. His predecessor, as may be remembered, was Mr. Cockerell. Mr. John Pye, long a corresponding member, died, it will be recalled, in 1874, at a very advanced age,—very nearly, we think, a centenarian. Mr. Herbert has been a corresponding member since 1880; Mr. Fred. Leighton since 1873; the last appointed, Mr. Newton, of the British Museum, a much-esteemed correspondent, since 1866; and Mr. Charles Perkins, of Boston, the author of a work not sufficiently well known in England, giving a very complete history of the earliest days of Italian sculpture.

In the Academy of Moral and Political Sciences, we find as foreign associate the distinguished name of Mr. Gladstone, who has had as predecessors the equally well-known names of Hallam, Grote, Macaulay, and Lord Brougham.

In the Academy of Inscriptions and *Belles Lettres*, we find as foreign associate Max Müller; as corresponding members, Sir Henry Rawlinson, Layard, Samuel Birch, Lane, and John Muir.

In the Academy of Sciences, as foreign associates, Sir George Airey, Owen, and the late Sir Charles Wheatstone, who had as predecessor Herschel. As corresponding members, Lockyer, Sir Charles Lyell, Hooker, Carpenter, and Adams. Paris.

#### PUBLIC WORKS AT SOUTHPORT.

THE rapid extension and growing importance of Southport is shown by the number of its companies for building and other constructive works. These companies, which are being organised in quick succession, include the Southport Artisans' and Labourers' Dwellings Company, the Southport and Gathurst Brick and Tile Company, the Southport Botanic Gardens, and Museum Company, the Southport Pavilion and Winter Gardens Company, the Southport Pier Company, the Southport Victoria Pier and Promenade Company, the Southport Zoological Gardens Company, the Southport and Ainsdale Brick and Tile Manufacturing Company, the Formby and Southport Land and Building Company, the Birkdale Park Land Company,

the Skelmersdale Land and Building Company, the Ravenhead (Southport) Sanitary Pipe and Brick Company, and the Southport Glaciarium and Ice Manufacturing Company, which took possession last week of the estate on which its works are to be erected, and which are immediately to be commenced. The aggregate share capital of these several companies amounts to upwards of 500,000. In addition there are several hotel companies, bath companies, tramway companies, and water companies, together with other companies of a miscellaneous nature, including a steam laundry company, parcels and luggage company, carriage company, aerated water company, storage company, hydropathic and other companies, representing in the whole a share capital of more than 1,350,000. Several of these companies are already paying good dividends, the last dividend of the Botanic Gardens and Museum Company being at the rate of 10 per cent. per annum; the Victoria Pier Company, 10 per cent.; the Pavilion and Winter Gardens, 5 per cent.; the Tramways Company, 8 per cent.; the Southport Pier Company, 6 per cent.; and the Birkdale Park Land Company, 10 per cent.

#### THE SURPLUS LANDS OF THE EAST LONDON RAILWAY.

LAST week Messrs. Farebrother, Ellis, & Clark sold, at the Mart, a large quantity of the surplus lands and buildings belonging to the East London Railway Company. The property, which consisted of twenty-three lots, is situated partly in Whitechapel, near the Station and London Hospital, and partly in St. George's-in-the-East, but the most valuable portion is in Wapping High-street. The Wapping property included, amongst several other plots of building land, a large area in High-street, situated in close proximity to the London Docks, the Company's station, and also to the Wapping pier of the Steam Ferry Company, whose works are now in course of construction. Before the lot was offered, the auctioneer said that under an arrangement into which the company had entered the purchaser would not be permitted to erect any buildings upon the land for a period of six months, or until the works of the Steam Ferry Company were completed and opened. The property, which contains an area of 12,000 superficial feet, was sold for 4,500. The proceeds of the day's sale amounted to about 11,000.

#### MONUMENTAL.

*Lairg, N.B.*—Mr. Westland, of the North of Scotland Granite Works, Inverness, who has just procured a lease of the granite quarry at Dalmore, parish of Rogart, from his Grace the Duke of Sutherland, has been commissioned by the duke to execute a monument, which is to be erected at Lairg, in commemoration of the recent extensive reclamations there. The stone is to be taken from the Rogart rock, and the monument, when finished, will be 33 ft. in height.

*The Liebig Memorial.*—The sum of 140,000 marks having been collected for the Liebig memorial, the committee have decided to close the subscription lists. A discussion about the site of the projected monument has arisen between the rival committees of Giessen and Munich, the former claiming the statue on the ground that from their university Liebig's fame first issued to the world; the latter, because their capital was latterly the scene of his labours. It has been decided that both towns shall have the same memorial, which shall be cast in bronze.

*Wark Mechanics' Institute.*—The need of a large hall and rooms for the accommodation of the members of the Mechanics' Institute at Wark-upon-Tyne has long been felt, and, chiefly through the liberality of Mr. Hugh Taylor, of Chipchase Castle, this public want has now been supplied. A neat stone building has been erected at Wark, and, in addition to a large hall, capable of seating about 400 persons, it contains reading and smoking rooms for the members of the Mechanics' Institute, and also rooms for the librarian; and in a neat tower, in the centre over the entrance, is placed a large clock. The total cost is nearly 1,900. towards which Mr. Hugh Taylor has given about 1,500. It is intended to add a large number of books to the library, and 80. have been subscribed towards the cost of doing so.



## TEMPLE BAR IMPROVEMENTS.

THE proposed removal of Temple Bar, and the recent debates thereon, more especially as regards the great improvement which could be carried out at this spot, and which in a very few years *must* be carried into effect, remind us that this is not the first time, by a great many, that the widening of Fleet-street hereabouts has been the subject of civic controversy.

The great highway which for so many centuries was the only thoroughfare between the City and Westminster was, as early as the reign of Edward II., one of the most uncomfortable roads to travel by that can well be imagined. In the rainy season there was a continuous interruption to the traffic, through faggots and bushes, and great holes, obstructing the traveller at nearly every few yards, and so bad did it become that a special tax upon wool, wine, and leather had to be levied for its repair. We are told that about this date there were two or three forges in the main thoroughfare, and sundry sheds of a decidedly mean appearance. To have allowed this state of things to continue any length of time is, to our more refined habits of the nineteenth century, a mystery; for, in the reign of Edward III. the banks of the river between Ludgate and Charing Cross had the town mansions of the greatest of our nobility, and their only land entrances were from the Strand and Fleet-street, the roadway of which, in the old chronicles, is described as "full of pits and sloughs, very perilous and noisome" to the passers-by. Five hundred years ago we find Bridewell a palace, Whitefriars a monastery, and the Temple on the eve of being occupied by the lawyers. The Bishop of Bangor lived in Shoe-lane, and the Bishop of Salisbury had his town-house where Salisbury-square now stands. In the Strand, the Bishops of Exeter, Durham, Bath, Chester, Lichfield, and Llandaff, had their "inns," as the mansions were then called; while the Savoy, the site of the great Simon de Montfort's residence, and where John, King of France, was held a prisoner, existed then in all its princely grandeur. The hospital of St. Mary Rouncival stood where subsequently was built Northumberland House. Hence it will be seen that the highway from Westminster through Temple Bar was by no means an unimportant thoroughfare, and yet it was not till a century later that a stone pavement was substituted for the miry road.

We do not propose to go into the history of Fleet-street or the Strand, or exhaust our readers' patience with memorials of Temple Bar; but our object is to give a few collected facts about the improvements which have been carried out in the district which Wren's gateway has now made famous throughout the world. After the Great Fire of 1666 we find, by a plan preserved in the British Museum, that the width of Fleet-street, between Whitefriars and Fetter-lane, was 70 ft., and from Fetter-lane to Chancery-lane, 37 ft. Wren proposed a straight street from Temple Bar to Tower-hill, 90 ft. wide, with a circus in the centre of Fleet-street, from which eight streets were to branch. To those at the present time who are holding strong arguments as to the requirements of Fleet-street for the "still-increasing" traffic, the following quotation from Mr. Noble's book may not prove uninteresting:—"Taking the width of Fleet-street at Temple Bar into calculation,—23 ft. 8 in. the roadway,—no benefit whatever would result in the demolition of the Bar, as, granting that the pier does take up a trifle of the way, fully 6 ft. would be required extra, so as to make a safe passage for another line of vehicles, by giving which, *unless the street were set back some 8 ft. or 9 ft.*, the present narrow pathway for pedestrians would have to be considerably narrowed." From actual measurement of the Bar we find that the width of the street, between the extreme piers by the houses, to be 43 ft. 2 in., and that the opening of the centre arch of the gateway is 21 ft. Now the foot-passenger traffic is to be studied quite as much as the vehicular, and it is well known that the former is very great at this point. For many years past this has been a great grievance, and it certainly would not have been of any use to pull down the Bar,—an expensive and obstructive process whenever it is done,—unless the houses had been taken down too. It was this argument that the Corporation raised years ago, but at the present time it has come to an end by the demolition of the buildings on the north side, and the proposed widening of the street at this part.

Looking at the St. Clement's side of the Bar,

it is wonderful to observe the change hereabouts within the past century. The "dismal pass" was for centuries a standing disgrace to London. It may be described as a triangular block of houses extending along the centre of the present roadway of the Strand as far as St. Clement's Church. In Addison's time this narrow outlet from the City was known as "the Straits of St. Clement's." Branching from the Bar, the southern street formed the Strand; the northern, leading to Wych-street, was called Butcher-row. Mr. Diprose tells us it was chiefly occupied by fishmongers, butchers, bakers, and tinsmiths. The houses were wooden and large. The rooms had low ceilings and rickety casements. To the public-spirited Alderman Pickett, London was indebted for the removal of these dens. A brief account of this improvement will no doubt prove of some interest at the present time.

In 1787, at the request of several of the residents, the Alderman presented a petition to the City Council praying the removal of Temple Bar and the block of houses on the west. The subject was referred to a committee, and to this body Alderman Pickett submitted three proposals:—To take down the Bar and sell the materials; to ask Messrs. Child & Co., the bankers, to dispense with the six months' notice which the Corporation were (and still are) compelled to give them; and to obtain from the City Surveyor a report of the value of the property between the Bar and Essex-street in the Strand. The proposal to pull down the Bar was lost on a division, and the other proposals were thereupon withdrawn. A few months later the Alderman asked the Common Council to appoint a select committee to inquire into the matter, but the motion was outvoted by a majority of seventy-two. Although this persevering citizen was subdued he was not conquered. He sent round a lengthy printed letter, stating that he was not desirous to remove Temple Bar if the improvement could be carried out without doing so. At a subsequent Court of Common Council a motion to apply to Parliament for powers to carry out the scheme was rejected by a majority of thirty-six. At Michaelmas the Alderman asked the Common Hall to agitate the question, but he could not find a single liveryman to second his motion. And in the midst of the controversy up started Pasquin, the poet, with his "Metropolitan Prophecy":—

"If that gate is pull'd down 'twixt the Court and the City,  
You'll blend in one mass, prudent, worthless, and witty,  
If you league cit and lordling as brother and brother,  
You'll break order's chain, and they'll war with each other."

In March, 1789, Alderman Pickett issued a thirty-eight paged pamphlet advocating his views. He described Temple Bar as a nuisance, a screen for filth, and a protection to pickpockets. He proposed to erect in the place of the stone structure "a noble and ornamental pilaster on each side, with chains agreeable to the ancient bars." He exhibited two plans at the Royal Exchange, and headed a subscription list for the improvement with 100l. Four years later a committee reported on his plans, and stated that the removal of 125 houses would cost 121,110l. Parliament was petitioned, and ultimately an Act was obtained 35 Geo. III., c. 126, June 26, 1795, which allowed seven years for purchasing the property, and ten years for completing the improvement. This Act was, however, only the first of six which were found necessary before the scheme was carried into effect, and in these was included another proposed work—the demolition of fifty-one houses at Holborn Bridge, and the construction of a new street, subsequently known as Skinner-street, and lately removed for the Holborn Viaduct improvements. Alderman Pickett did not live to see his great idea carried out; he died the 17th of December, 1796,—and, if coincidences are worth anything, exactly eighty years to the very day, later, we find the Common Council still holding debate whether Temple Bar shall be taken down!

With regard to the Temple Bar improvements, after the permission of Parliament had been obtained, the "island" of houses so long known as Butcher-row, was levelled at an expense of something like a quarter of a million of money, the Strand was thrown open as we now see it, and the whole of the vacant ground on the north side between the Bar and St. Clement's Church let to contractors for the erection of new building. Now, somehow or other, there was a decided fatality attending the whole of this property from first to last; for, after 150,000l. had been expended in new houses, the majority continued unlet for several years. Here was a

dilemma never expected, and in the end Parliament was asked to sanction the disposal of the whole estate, and the other houses at Snow-hill, by means of a lottery. We could give an almost endless description of the result: how three lotteries were held—the first in April, 1807,—how they failed, how the property was sold to two speculators for a mere nominal sum, how those gentlemen in turn became bankrupts, how one of the partners obtained his certificate, bought up what remained of the estate, broke his contract, and left the original promoters with a loss of something like 54,000l.! We could also tell of many sad scenes that took place over this gigantic failure, but space will not permit. The property, even down to modern times, was never of the best paying description, and the names of Pickett-street and Pickett-place are well remembered to this day. And while the houses were being pulled down for the New Law Courts site, it may be recollected that one fell outwards into the Strand, thus being at the last a trouble to the owners. It is also a curious fact that while the buildings at Temple Bar and Snow-hill were called into existence at the same time, they were also demolished together,—the former for the Courts of Law, the latter for the Holborn Viaduct.

We have thus detailed as briefly as possible the history of the Temple Bar improvements. At the dawn of the present century they created the most lively amount of interest in all classes of society throughout England,—for the whole district between the Bar and Wych-street, extending northwards to Lincoln's-inn, was one of the most depraved, and contained the greatest number of dens of infamy to be met with in London.

The City architect informs us that when the Law Courts are finished, and the street widened, the width at Temple Bar will be about 64 ft. To span this width will require an arch of proportions by no means suited to the thoroughfare. In place, then, of Temple Bar what is to be erected?—for the Corporation, even while they have only lately resolved to pull it down, seem determined to perpetuate the "time-honoured" site. A bar of some sort certainly existed from time immemorial, and from the time of the erection of the present building by Wren, the architect, and Joshua Marshall, the mason, in 1670-72, down to the year 1753, the gates were closed nightly and opened every morning. Such a practice could not be tolerated now, but we cannot see any reason why the site of the old bar should not have a distinctive landmark, which might be ornamental as well as useful. But it is that feature which terribly upsets the Council of the City.

Now, with respect to the "proposed" widening of the thoroughfare leading through Temple Bar, as shown on the plan lately issued by the City Lands Committee, we find three distinctive lines drawn, each of which will very materially widen Fleet-street and the Strand. But two only of the lines are really worthy of notice, and these are:—

1. A straight line from No. 227, Strand, to No. 33, Fleet-street (opposite St. Dunstan's Church), thus entirely or partially removing some forty houses on the south side, while on the north side, Nos. 203 to 193 (the corner of Chancery-lane) would be set back, in both cases, making the width of the street at Temple Bar 70 ft., instead of 43 ft. 4 in. as at present, and 62 ft. at Chancery-lane instead of 55 ft. 3 in.
2. The second, and most desirable "line" is from the corner of Essex-street (opposite St. Clement's Church) to the same place in Fleet-street, at No. 33. This would necessitate the removal of some forty-four houses, but in return we should have the street at Temple Bar 80 ft. wide instead of 43 ft. 4 in.; and at Chancery-lane 70 ft. instead of 55 ft. 3 in., the whole being not a foot too wide to exhibit the architectural façade of the new Law Courts, and any other new buildings that would be thereabouts erected.

But the great trouble at present is how is the cost to be met? Neither the Government nor the Metropolitan Board of Works appear the least desirous to hasten an advance as their share of the million of money which this improvement will cost, and the City, on the other hand, does not see its way clear to expend this amount of the citizens' money, when the improvement will be not so much local as it will be metropolitan. Time, however, passes quickly on, and probably one of these days there will be adopted a plan of such a nature that will be worthy of the site, and will make us feel surprised it was not carried out long before.



## "TEMPLE À LA VICTOIRE."

UNDER this title we have before us a publication, printed for private circulation only, which takes us back to a phase in the history of architectural taste and study in this country which is by many now almost forgotten,—when Greek architecture was, by common consent, admitted to be the subject most worthy of study, and of the highest enthusiasm of the modern architect. When Professor Donaldson was a student at Rome, in 1819, the restorations of some of the Classic temples made by his French fellow-students (a practice still forming an important part of the higher curriculum of the French student of architecture) suggested to him the idea of making a restoration not of a single temple, but of such a group of buildings as might have been sufficient for every purpose of celebration and commemoration in connexion with the great games of Greece, and of which the temple of the deity to whom the games were dedicated, and who was what in later ages might be called "patron saint" of the whole, would form the central point. This idea recurred to him in the course of his travel through Greece and Asia Minor; and on his return to Italy he endeavoured to put it into more definite shape. To quote from the Professor's own classic French,—"Je me souviens qu'un soir, après une représentation au théâtre San Carlo, je rentrai à mon hôtel, l'imagination encore impressionnée par le spectacle et la musique dont je venais de jouir. Malgré l'heure avancée, je me vins au travail et j'essayai de donner un commencement de réalité aux idées que m'absorbaient. En deux nuits, j'eus achevé l'esquisse d'un 'temple à la Victoire entouré de tous les édifices nécessaires à la célébration des anciens jeux de la Grèce.' Revenu à Rome, je consacrai toute une année d'études à l'achèvement de ce travail, à l'exemple des pensionnaires de l'École Française, qui sont tenus, pendant leur dernière année, d'exécuter la restauration d'un monument de l'antiquité. Cette obligation, qui était à peu près tombée en désuétude à l'époque dont je parle, a été remise depuis en vigueur avec le plus grand éclat par mes anciens amis Le Sueur, Blenot, Léon Vaudoyer, et d'autres dont le renommée est impérissable. On ne saurait méconnaître combien elle initie à tous les secrets de l'art antique et pénètre les artistes des vrais principes du goût en architecture."

The design when completed was shown to Canova, who had it exhibited at the Academy of St. Luke, and its author was elected a corresponding member of that Institution; and it obtained a gold medal when again exhibited at the Paris Exhibition of 1861. The illustrations, with an "explication historique," written purposely by Professor Donaldson, have been recently published in the *Moniteur des Architectes*, and the essay is now reprinted, with the plan and bird's-eye view of the design, as a folio pamphlet, in "hommage respectueux de l'auteur à ses amis et à ses confrères."

The design is a symmetrically-disposed group of buildings, crossed in front by the *stadium*, which is flanked by a colonnade and ranges of seats for spectators; behind this is an amphitheatre for a *naumachia*, or "sea-fight parade" (as one might translate it), with a naval and a military trophy on either hand of the structure; beyond this the *Academia* and the *gymnasium* facing each other, and between these we proceed to the temple, flanked by quadrant colonnades, as at the Vatican, and in the centre of a wide oblong enclosure, at the further end of which the theatre, overlooking the sea, closes the composition. The architecture is supposed to be of the period of Hadrian, in order to furnish the excuse for combining something of Roman richness and freedom of decorative treatment with the general forms of Greek architecture, and is placed on the slope of Mount Ithome, the beauty of which had struck the author during his travels.

We would rather have conceived the erection as pure Greek, since it is entirely a matter of imagination, and there are no clients to please. The design embodies a noble architectural scheme, more extensive probably than ever existed in Greece at one spot. The whole tone of the essay, and the nature of the architectural idea illustrated, imply a culture wider and more refined than, we regret to be obliged to feel, it would be easy to find illustrated in the younger generation of architects around us.

## THE NEW SCHOOL BUILDING IN THE BOULEVARD MALESHERBES, PARIS.

WE have long watched with interest the architectural progress of this building, in which we have been especially struck by the copious use that the architect, M. Hector Degeorges, has made of first-rate terra-cotta work. The establishment of this school is the result of an active movement in Paris—indeed, throughout France,—in favour of primary instruction. The *bourgeoisie*, who have been perfectly satisfied with the opportunities offered by the University, have overlooked the sanitary arrangements, which M. Waddington, the Minister of Public Instruction, is disposed to give such special application to, and he has advocated a greater attention to the advantages offered by healthful exercise, such as we in England have long paid almost too much heed to. What the Universities, therefore, have alone attempted to introduce by successive efforts, private initiative is about to realise,—an education and instruction suitable to the needs and aptitude of the child at every age.

The most remarkable creation of this nature, says M. Thomas Grimm in a recent article on this subject, from which, indeed, the following details are borrowed, is, without doubt, that of the *École Monge*, founded in 1869, by a former pupil of the *École Polytechnique*, M. Godard, and which a clever architect, M. Hector Degeorges, has just rebuilt under exceptional conditions, on some ground near the beautiful Parc Monceaux, in the Boulevard Malesherbes; a neighbourhood which, in course of time, promises to be the most favoured of Paris. Here the editor of the *Siècle* and M. Menier have built magnificent mansions, and here are centreing a number of fine residences.

We will not enter into the details of the method followed out at the *École Monge*; we will simply mention the considerable part played, with the children, by *lessons of things*, an American importation, which familiarises the mind with ideas of daily application, at the same time facilitating the study of abstract science. What we wish to praise is the building itself, and the talent with which the architect has known how to provide for the wants of the pupils. M. Degeorges has shown himself discreet in his exterior decoration; in revenge he has distributed with true prodigality air, water, and light. Every progress that has been realised within the last twenty years has been applied by him. The whole of the building pivots, so to speak, round an immense covered court, where M. Eugène Paz has disposed the most varied gymnastic apparatus. This court has a superficies of 1,600 metres. Round it on the ground floor and on the first floor are the class-rooms, with their perfected fittings, maps, pictures of natural history, and glass cases containing mineralogical, botanical, and other specimens, which transform each of these rooms into a small museum for the use of the children.

From the covered court the staircases lead to the dormitories of the second floor, or to the refectory established below the ground floor. It is through the covered court that the pupils pass to go to their separate class-rooms; and it is on this court that open the director's study and the different offices; all the movement is, in fact, concentrated in it. Another court, not covered, of a superficies of more than 3,000 metres, is destined for the ordinary recreations. Above the class-rooms are the dormitories, each pupil having a separate room. Below, half under ground, well lighted, are the immense refectories, of which the ceilings are in cement, the pavement of tiles, as also the walls. This costly but healthy disposition allows of the whole apartment being completely purified of bad air or dirt; unnecessary is the brush, for all is washed with sluices of water. The heating by hot-water, and the ventilation merit also special mention. The *École Monge* possesses 180 beds for boarders. It enters into the plans of the founders to fill their house especially with children and young people, preserving at the same time the interior life.

**British Museum.**—We are very glad to learn that in future the British Museum will be closed, for the purpose of cleanings, &c., during the first week in February, the first week in May, and the first week in October, instead of, as hitherto, during the first week in January, May, and September. We have before now pointed out the objections there were to closing the Museum on New Year's Day and at other holiday times.

## A DOUBTFUL POLICY.

THE occurrence of another "landslip" in the cutting of the Great Western Railway at Horbury, near Leamington, recalls the circumstances under which that cutting was first constructed, and has been allowed to remain a constant source of trouble and danger. When Brunel designed the railway from London to Birmingham he boasted that he would have no tunnels for the whole distance of 125 miles. The only point along the route where any difficulty was experienced in carrying out this wish was at a place called Horbury, where the line runs through a deep bed of blue clay, lying on high land, and extending for a couple of miles. The highest portion of this clay deposit is at the hundredth mile from London, where its surface is some 150 ft. above the average level of the surrounding country, and of the line of railway on each side. The great engineer elected to make a cutting instead of a tunnel, but the soft nature of the *lias* soil, and the depth of the cutting, proved such formidable difficulties that he was forced to yield to circumstances, and to bore through a small portion of the bank, and form a short tunnel, about 200 ft. long. This practically is not longer than many wide bridges, and it does in fact form a bridge for the old roadway across the line. But the open cuttings on each side, and particularly on the eastern end of the tunnel, have been a constant source of trouble; year after year landslips occurred, blocking up more or less completely the line of rails. By degrees an enormous excavation was made, which promised to afford immunity from danger, and the opening at the top of the cutting from one side to the other cannot be less than 300 ft. The heavy rains, however, of the last few days have proved too much for the stability of the soil, and many tons of earth have fallen down to the rails beneath, raising them several feet, and entirely covering the "up" line. There is now nothing for it but to continue the cutting still further outwards, or to face it with a thick masonry wall and buttresses.

The bed of clay contains many fossil shells, and is for many reasons—engineering and geological—an interesting locality. The works now going on afford an excellent opportunity to geologists to visit the spot and collect some valuable specimens of the former inhabitants of an upraised inland sea.

## INSTITUTE OF PAINTERS IN WATER-COLOURS.

IN the winter exhibition of the younger water-colour Society there are some good but scarcely any remarkable works, and a considerable proportion of uninteresting matter. Mr. J. D. Linton contributes several drawings, of which the largest and most important, "The Huguenot" (214), hardly tells its story, and the figures lack character, except that of the soldier waiting stolidly to execute orders upon the victim. A single figure, "The Student" (195), is in the artist's finest manner and feeling; a strong figure clad in black velvet seated in earnest thought, facing the spectator; the expression of concentrated reflection is admirable, and the colouring very rich and harmonious, though sober; there seems something not quite satisfactory in the foreshortening of the left leg. "A Letter to Phyllis" (250), by Mr. Seymour Lucas, is a remarkably clever study of an elderly bean of the *Spectator* stamp laboriously inditing an epistle, his face three parts turned from us, but full of character: the dress and accessories are treated with admirable broad and perfectly effective handling. Mr. Collier's "Burham Ferry" (201) is not a drawing of such excellence or importance as he is accustomed to exhibit here, but has his usual excellent characteristics of pure and bold water-colour treatment. Miss Elizabeth Thompson sends a large sketch of the "Scots Greys advancing," at Aldershot (144), the line of horses coming rather confusedly over the uneven ground, in a very real sort of manner, though the drawing of the animals seems rough enough in some particulars. Mr. F. Skjell's small sketches, "On Yarmouth Beach" (189) and "Ploughing, South Devon" (235), are very good; the latter shows real originality. Mr. Townley Green's drawing of boating men taking their ease in their inn "Up the Thames" (55) shows conscientious study of character, and very careful execution; the types of humanity of the amateur athletic order are very well discriminated, and belong to



a phase of life which has not had due attention from artists of real originality as yet. Mr. C. Green's "Street Musician," with less refinement, has a half-humorous pathos which is noticeable. In landscape Mr. Syer is well represented, but with less originality of style and subject than he has sometimes shown: Mr. Orrock ditto; Mr. Mogford exhibits drawings a little out of his usual beat in effect and scale of colour. Messrs. Absolon, Hargitt, and Harry Johnson are duly represented; Mr. W. L. Thomas's Switzerland drawings are very good, and have some speciality of character; Mr. Hine has an exquisite little sketch of "Cuckmere Haven" (13), a white chalk cliff, topped with long folds of green sward; and Mr. Aumonier, whose name is always welcome, exhibits a beautiful study under the title of "Spring" (68), a bank of primroses for foreground, young shoots of trees and a bit of common land, backed by a sky most tender and atmospheric in its delicate tints. Several drawings by Mr. Hugh Carter, who derives his inspiration as to manner and subject a little from Israels, are worth attention; and so is Mr. Carrick's fresh and healthy-looking sketch of a pastoral scene, under the title of "The Skylark" (205). On the whole, the best things are to be found among the figure subjects, as is often the case at this gallery. In contradistinction to the usual tendency of exhibitions of works in water-colour, which is certainly pre-eminently a medium for landscape.

### THE ARCHITECTURAL TREATMENT OF THE ROOF.

BY MR. H. H. STATHAM.\*

WE all know how, when we are thinking a good deal of any special subject, it seems to turn up wherever we look, sometimes in a quite unexpected manner. Thus, no sooner had I communicated to our Secretary the title of my proposed paper, "The Architectural Treatment of the Roof," and was doubting whether after all there were anything profitable to say about it, than, in looking quite accidentally over a volume of Mr. Ruskin's Oxford lectures, I came up the sentence "All architecture is but a glorified roof." Here, at all events, I thought, is a text for my sermon, and one which happens exactly to express the point of view from which I propose to make a few remarks on the subject. No one, I trust, has been expecting a practical treatise on methods of roofing this evening. If that were not beyond the scope of my experience, it would at least be quite beyond the limits of an evening's paper. And yet I hope that we shall not be quite unpractical. It is useful sometimes to look back at the first principles of a form of building, and consider why we make it so, how it came into its present shape, and whether and in what way it is capable of improvement, in reference especially (in the present case) to its architectural suitability and expression.

Architecture, then, "is a glorified roof," or, to put Mr. Ruskin's comprehensive formula into plain prose, the object of every building is to cover in a space. Taking it this way, the subject forms the natural complement to that of plan, on which I had the honour of saying a little here last session. You define the area and outline of the ground to be occupied by your building, and the manner in which you propose to divide and arrange the space, so as to make the most of it; and that is *plan*. You then roof it in: and a great deal of the character and expression of architectural structures depends upon the mode of roofing, the material employed, but most especially the relation which the roof bears, in shape and proportion, in constructive principle and material, to the substructure.

The mere proportion, in size or height, between the roof and the walls of a building (in cases where the roof forms a visible portion of the architecture) has a most important effect in determining the predominant expression and character of the architecture; and I touch on this point first, because it brings us back to the first beginning of building. Most of the primitive structures we know of, those which constitute the first beginning of architecture, have no walls, in the strict sense of the word. In his suggestive though rather too fanciful treatise on "The Habitations of Man in all Ages," M. Viollet-le-Duc represents the first rude attempt at a house constructed by planting young trees in the ground in a circle and then

bending them over till their stems met and were secured in the centre. That is a not unlikely theory, confirmed by what we see or hear of the habitations of savage people in the present day. The tent, too, which is one of the earliest forms of habitation, is simply a movable roof. The Esquimaux snow-but at present is a kind of diminutive dome, placed on the ground. In all these primitive forms architecture is simply a roof, though hardly a "glorified" one. We might perhaps go further than this, and notice that the oldest arched buildings we know of, the tombs or treasuries of the Etruscans, the *topes* of India (of one of which you may see a model in the Architectural Court at South Kensington) are vaults arched almost from their floor level; but in these cases the form is to be traced, perhaps, partly to the fact that the structures were intended as tombs. But, at all events, we connect the idea of the simplest and most unsophisticated form of architecture with structures such as the tent and the wigwam, which are simply a covering—a roof placed on the ground. Now this is rather a significant fact, because it is probable that it is to a great extent the half-unconscious association with this rude form of architecture which leads us to regard a building where there is a great deal of roof in proportion to the walls as "picturesque" and rustic in character, while for the attainment of a more grand and "architecturesque" effect (to use my friend Professor Kerr's word, which I think a much too useful one to be dropped) we feel that the walls must be raised to a loftier relative proportion. I think this general law will be found to hold good, and especially in those cases where the roof is of a different and lighter material than the walls. If the members of the Association here present were asked each to make a sketch for a country church and a town church, we should be almost sure to find that the majority of designs for the former showed low walls and a high roof, and the latter nearly the reverse proportion; and when we want to give characteristic expression to cottages, rural almshouses, lodges, or farmhouses, we nearly always run the roof up into high gables and ridges, which we feel give the character of homelike and simple picturesqueness more than almost any other expedient.

This picturesque and rustic effect, however, is partly dependent on having roofs of a lighter material than the walls, thus further keeping up the resemblance to the tent and wigwam origin. But this, with all its picturesqueness and character, cannot be regarded as a complete or a dignified form of roofing. The whole system of roofing may be divided into two main sections: roofs which are formed of a different material from the walls, laid on the top of them, and roofs which are of one homogeneous material with the walls and are, in fact, the walls continued horizontally or in an arched form until they shut in the space at the top as well as at the sides. Now, it appears to me that no architecture can be considered to be absolutely complete, or to have attained the highest and grandest monumental expression, which does not include the homogeneous construction of the roof, as a part of the walls. The bridging of the space enclosed with timber or other light and comparatively perishable material placed on the walls, is only a makeshift after all, a shirking of the real problem of the "glorified roof." It is the old tent or wigwam elevated on a stone wall. The Greeks were content with it, and it has been the one weakness of their architecture; their temple roofs have perished long ago, and for many years it was believed that their temples had no roofs and that the Greeks, like the wise men of Gotham, enclosed a space with walls, and left it open to the sky; as if anything that could be called architecture could be produced in that way. The Egyptians, who roofed their buildings, so far as they had a permanent roof, with slabs of stone, achieved thereby a monumental and thoroughly homogeneous character in their architecture, though, of course, the space that could be bridged between supports in this way was very limited, and compelled the use of a great number of supports. This is, perhaps, the earliest and not the least striking instance of the influence of methods of roofing upon the whole style and expression of architecture; for I should think it very doubtful if the forests of columns in the great halls of the Egyptian temples would have existed but for the necessity of numerous supports to a roof where neither the arch nor timber was to be used. The idea may have been extended for the sake of an impressive effect; but it must certainly have originated in

constructive necessity. But without the arch, any monumental building in the grandest way and on the grandest scale is an impossibility. It is to the arch that we owe all the greatest achievements of the building art, more especially in raising architecture from its sombre or quiescent character, as among the Egyptians and Greeks, and giving it an upspringing life and energy.

At what time in the history of building the arch was invented no one can say now; probably, however, it was quite prehistoric, and was used long before the Greeks, whose neglect of it in building seems to confirm the idea that their architectural notions were derived mainly from the Egyptians to begin with. Viollet-le-Duc, who has such a remarkable faculty of putting himself in imagination in the circumstances of ancient builders, has given an imaginary sketch of the first introduction of the arch, which is as likely to be true as anything else, and is at least amusing. He credits the Assyrians with the invention, thus: they roofed their houses with a system of reed or bamboo framing with longitudinal bearers laid on it, forming a curved outline, and piled a mud or clay roof on this, which in course of time hardened and was found to be independent of the bamboo supports, which were sometimes removed. Then "a man held in great respect for his knowledge, whose name was Kabu, proposed to build on the curved reeds in the same way as walls are built; that is to say, laying the bricks as you see here; consequently, to pass from the vertical direction in which the wall now lies to the curved direction of the arch, without leaving any angle between the two directions; in a word, to carry the bricks round in a complete semicircle. Thus, the wall would be continued, so to speak, curving over more and more.

It appears that Kabu had much difficulty in getting his idea adopted; the elder men pronounced him crazed, asserting that a wall ceased to stand the moment it deviated from the vertical. Kabu constructed a small arch according to his system, but his model did not please the elders: they told him that though his principle might hold good on a small scale, such a construction executed on a large scale would infallibly break down. Then Kabu had wedge-shaped bricks made of the size of ordinary bricks, and placing them together dry, without the interposition of wet clay, demonstrated by experiment that the bricks would hold together of themselves."

After that there was nothing for it but to banish Kabu, as a man who had impiously contravened the laws of nature, and then proceed to work out his principle: a conclusion of the story which has its parallel in the history of some more modern inventions.

The two great applications of the arch to the realisation of the "glorified roof" were, of course, the dome and the Gothic vault; the mere barrel-vault stands on quite lower ground than these, as it so little affects the design of the substructure, its stability and support being a mere question of thick walls. But the dome and the Gothic vault have the most direct relation to the shape and arrangement and the architectural motive generally of the substructure. The dome is the covering of buildings in which wide central area predominates; the vault, of those in which length predominates. It is not necessary here to go into a description of the principles of the dome and the vault; what I especially wish to remark upon is the difficulty which seems to have been found in carrying out in its integrity the principles of homogeneous building for which these methods of construction appear to furnish opportunity. Although the dome and the vault have been used to such a great extent in Roman and post-Roman architecture, there are comparatively few instances of any note in which the built dome is used as the real roof, irrespective of any other covering; and as far as I know there is not one in which a vaulted roof is so used. Always we have the slated or leaded timber roof as a perishable covering over what is the real built and monumental roof. Perhaps the feeling of most people is that this exterior covering, especially when high-pitched, adds an important element of picturesqueness to the structure, and is the best architectural finish that could be made. But it is most important to take into account the immense effect which habit has upon the judgment in such matters. We are always accustomed to see Gothic churches and cathedrals finished with timber roofs, just as we are always accustomed to see a man finished with a chimney-pot hat; and we get into the habit of accepting each culmination as the natural and inevitable one. But if we could look

\* Read before the Architectural Association on the 6th inst.



on Mediaeval buildings afresh, and with unprejudiced eyes, or if we place ourselves mentally in the position of a person doing so, I think we should perceive that the monumental effect of a great and important building is seriously affected by crowning it with a perishable material. It is as if the real builder, the mason, tacitly confessed at this point, "I can go no further, you must now call in the carpenter and plumber." When the new building which has taken the place of the old Chester Cathedral was in progress, it was proposed to render the metamorphosis more complete by crowning the square centre tower with a high shingle spire. I remember seeing a drawing of the project. It was to me very much the same as if you were to place a bonnet (if such a thing is to be found now) on the head of a marble statue, as an appropriate finish. In the case of the vaulted roof there is a practical as well as an architectural difficulty: the natural upper surface of a vault leaves valleys and pits which render it impossible to accept it in its unsophisticated state as a bedding for a weather-proof covering. In the case of the dome, which leaves a regular and unbroken exterior surface, there is not this difficulty; the difficulty is here a more purely architectural one. The dome, which is to my thinking by far the grandest and sublimest architectural feature that has ever been invented, has almost always presented itself, nevertheless, in the shape of a most formidable dilemma to the architect, in the great difficulty which is experienced in rendering the same dome effective and well proportioned to the substructure both internally and externally. The greatest triumph of the dome is in its interior effect, but this is rather injured than otherwise by making the dome too lofty, taking it too far from the eye, and thereby diminishing its perspective. Externally, on the contrary, the dome almost requires exaggerating in height to produce an effect proportionate to its real height, because its lines are all falling away from the eye, and the result is that a dome always becomes stunted in perspective, except when viewed from a great distance. An extreme instance is the church of St. Sophia, probably one of the finest of existing interiors in effect, as it assuredly is in conception, but which externally, even in elevation, has a squat and dish-cover appearance, which must be still worse when seen in perspective. An increased difficulty in dealing with the dome externally arises from the necessity of having either a counterpoise or a chain at the branches of the dome, to prevent the chance of its rising there, and if a counterpoise is employed, by adding material to the dome at this point, it must almost necessarily be treated in design so as still further to reduce the apparent height externally. (This was illustrated by the section of the Pantheon.) The two ways out of the dilemma are, either to employ a treatment of the dome in keeping with its appearance as a low covering, — to avoid attempting a vertical expression at all externally; or to have one dome for the inside effect and another for the outside. I need not remind you that this last has been the usual way of getting over the difficulty in the architecture of Western Europe; and for this object, not merely two, but even three domes are found one over another. We are in the habit of admiring many of these very much; no one can admire St. Paul's dome, as a mere matter of effect, more than I do; but when we look at the sections of such structures, can we say that the effect is really in any way proportionate to the waste of material and the introduction of a specious but in reality flimsy architectural falsity? Here, again, it is useful to consider things apart from the influence of habit; and surely if we were to be shown for the first time the section of such a dome as that of the Invalides, or some of those which figure in competition drawings (where the dome is often, as Byron profanely said of St. Paul's, "like a fool's cap on a fool's head"), without having been taught to admire it, we should be disposed to say, "What a house of cards built up about nothing!" If we compare even the most sober of these cooked domes, as one may call them, with the Pantheon, we must admit how much more satisfactory to the judgment is the latter, in its solid unpretending reality. Brunelleschi did indeed at Florence build his dome on the same lines within and without, but he had to make it a pointed dome, losing the beautiful effect of the internal hemisphere, and even then it depends on a tie at the weak point; and that is not a complete building which has to be tied

together. The moral seems to be that we must not look to the dome for external effect in height, except on a small scale, at least if we would preserve the highest architectural consistency of design and construction; we must regard the dome on a great scale as mainly a feature for internal effect; or if we aim at external effect with it, it must be rather that of stability and repose than of aspiration.

[Reference was here made to a view and section of a Byzantine domed church (St. George at Thessalonica) which had a timber covering carried on a heavy mass of screen-wall built up above the dome, and a method suggested of carrying the sloping roof on light brick or stone spandrels built up on the haunches of the dome at intervals, and with a flat arch in hollow tiling connecting them and forming the bedding for the roofing-tiles; the screen-wall being altered in design, and reduced in bulk, and made to appear as a merely ornamental wall. Sketches were shown of the application of the same principle to the roofing of a vault, the ribs being similarly built upon up to the required uniform slope, and tile arches built between them in the same manner. In each case, it was urged, the introduction of any perishable material was done away with, and the building upon the back of the dome\* or vaulting ribs really gave increased stability, by weighting them on the haunches; and in the case of the vault, the ribs were really carrying the outer roof, and indicated the construction, instead of referring only to the inner ceiling. A method of avoiding the necessity for varying the radius or curvatures of the diagonal and transverse ribs in a quadripartite vault was suggested, by the intervention of an open circular light at the meeting of the diagonals (carried by the ribs, or by the ribs conjointly with the filling) which cut them off to the same length and height as the transverse ribs. By assuming the same radius also for the wall ribs, the three sets of ribs all spring from the impost with the same curvature; and though, from the wall-ribs being necessarily shorter than the others, the ridge of the transverse vault must be dropped considerably from the centre to the walls, this, in fact, only fell in with the whole scheme by accommodating this ridge to the slope of the roof, which came immediately upon it. The three sets of ribs did not, however, quit the impost at the same angle, nor was the carrying of the ring at the meeting of the diagonals quite satisfactory, as being dependent partly on the vaulting surfaces for its support (unless on a very small scale); it might be done more completely by a larger number of ribs arranged at equal angles, looking somewhat like a fan-vault, but in reality differing, as the ribs were the construction, which in the fan-vault they are not. It was observed that in this diagram the transverse rib was altogether omitted, the vaulting surface occupying its place, which might be considered a great heresy; but, in fact, the transverse rib in a Gothic vault was only an ornament after all. In a domical vault such as those of the Angoulême churches which the Association had visited this year, the transverse arch was as important as the wall arch, as it carried the doming; but in the true vault the only real problem was to intercept the thrust of the roof so as to concentrate it at the points buttressed, and the diagonal was all that was really necessary for this: the transverse rib was really nothing in the construction.]

But though we may deprecate the timber roof when used as a cover to what would otherwise be a homogeneous stone building, we certainly cannot deny to it an important place in architecture, the rather as it is in our own country that it has been more especially developed. Our "open-timbered roofs of the Middle Ages" have been a subject of admiration ever since the Gothic revival, though they have now fallen into disrepute, and are almost universally condemned as uncomfortable and dys-acoustic. I am afraid very little can be said in answer to these charges, on practical grounds: on architectural grounds I hold that no form of wooden covering is so good in effect internally as the high-pitched open roof with its massive timbers crossing and recrossing in perspective

and making mysterious shadows and half-lights above. Certainly the more recent fashion of a panelled ceiling in oaks, with an iron rod painted in corkscrew spirals to tie the concealed principals, is a sad falling off in truthfulness and effectiveness of treatment. I dislike and repudiate the iron tie altogether: as with masonry, so with timber, if you mean to make your roof in that special material, make it in the form which suits that material, and in which it may be warranted to stand secure without bandaging. Timber roofs may be divided into two main classes; those which exercise an outward thrust on the walls, and those which merely rest upon them with a directly vertical pressure. The latter class represents the tie-beam roof, which, of course, so far as the walls are concerned, is simply a beam laid across, and exercising not the slightest disturbing effect upon the substructure. Every thing except a tie-beam roof comes under the former class; unless, perhaps, we may consider the low-pitched roofs of the late Gothic period as practically without thrust. For mere utilitarian purposes the tie-beam roof is the simplest and probably the most economical; but it can scarcely be considered as in any sense conducive to architectural effect, and is seldom made part of the design; when it is shown, I think the queen-post form is decidedly more elegant than the king-post. But architectural expression is far better fulfilled by a roof which may be said to spring from, not merely to rest upon, the substructure. The entire structure then becomes a complete whole; the roof and walls seem mutually dependent upon one another in the design, the timber roof becomes a part of the architecture, instead of a mere covering laid across. I think this junction between the timber roof and the walls may be more directly and logically effected than it generally is. (Reference was made to an illustration, showing a cross-braced roof springing from arched buttresses turned inwards from the wall, so as to bring the joints of the masonry at right angles to the thrust of the roof-principal.)

This style of roof, with the cross bracing of straight timbers, appears to me to be more architectural than the employment of timber in curved braces (except in the laminated form). The old hammer-beam roof is very rich in effect, but it is anything but scientific; so much so, that it is really wonderful how some of them have stood so long; and I fancy some of them are prevented from pushing the walls out chiefly by the heavy counterbalancing weight of timber which is hung upon them inside. A form of roof which is at present a favourite for churches and other large interiors, with a high collar and long curved braces, is really a kind of modification of the hammer-beam principle, with the advantage that there are fewer points to "give." But these large curved braces, cut out across the grain or scarfed together, are really makeshifts. If you wish to use timber in a really characteristic and at the same time strong construction, keep to straight pieces as much as possible; and especially avoid, in open-timber roofs, any such absurdities as arcades and shafts, and such other imitations of stone architecture, which have a most gingerbread effect when introduced in a timber roof. And I hope no one here will ever perpetrate such a monstrosity as what is facetiously termed a "wooden vault." Anything more directly at variance with common sense and architectural propriety it would be impossible to imagine; a wooden imitation of the forms of a masonry construction hung on to the walls like an inverted cradle. The plainest tie-beam roof would be preferable. The defence set up for it is that the Mediaeval builders occasionally did so; to which the only proper reply would be, "Then they ought to have known better."

No consideration of the architectural treatment of the roof could afford to pass over the specially modern form, — the iron roof. One class of structure, in particular, has given a great opportunity and impetus to this form of roof, — I mean, of course, the railway station. How are we to class these great sheds architecturally? Externally, most of us should say that they are simply hideous; nor is it easy to see how they can be made otherwise, consistently with practical and economical considerations. Even these have their effectiveness, however, under some aspects; for instance, there is an admirable etching by Mr. Inchbold, of "Charing Cross," from the opposite side of the river, with the station-roof a black mass against the evening sky. It was published in the *Portfolio* some time since, and I could not have

\* It was suggested to me after the meeting, by a member of the Association, that a plan of weighting the dome at certain points was hardly consistent with its true theory, as a building up of complete circular rings of masonry. This is a correct criticism: to make the design and construction actually homogeneous, the dome should be a ribbed one; but the constructive idea may perhaps be modified so as to coincide with the true theory of the ordinary dome. — H. H.



believed so much artistic sentiment could be got out of Charing-cross Station. Internally, a well-constructed iron roof has a beauty and fitness of its own, the more so if it is left as simple as possible, and no attempt made to bedizen it with what is called ornament hung on to it,—cast-iron rosettes, and such things. I think that, as in the case of the wooden roof, many of these larger iron roofs would gain immensely in effect if their abutments were better designed, and if they were thus more specially and directly connected with the architecture of the station, where there is any. (The St. Pancras roof, for instance, had its real springing underground, and merely came through the platform. Had it been sprung, however, from massive visible granite abutments, its effect would have been infinitely better.)

But the fact is that, in spite of all that has been said, with apparent good sense and logic, about using the materials of our own time, and so on, iron roofs never can produce a grand, or anything worth calling an architectural, effect; the hard thin lines of the material are so opposed to all that constitutes architectural breadth and repose, besides that the material will not harmonise with anything else. The great extent of the large iron roofs of our day is quite unaccompanied by any corresponding effect on the spectator. Take the Albert Hall as an example: the roof there is nearly the same shape as the centre dome of St. Sophia, and rather larger; but I never heard the slightest evidence of its having produced the same effect upon any spectator.\* It is more than twice the diameter of St. Paul's dome, but it certainly never impressed me half so much. It is no use: extend the areas, increase the spans, as you will, you cannot produce architectural grandeur with a construction which, in comparison with a stone dome, is merely like a spider's web. As far as architectural grandeur is concerned, you must leave iron out of the category of methods of roofing.

Now, before quitting the subject let us give a moment's consideration to the ordinary everyday roof, on a small scale—the house roof. On this point I might again quote Mr. Ruskin, who, in the same lecture before referred to, observes that the modern architects never know what to do with their roofs, but that until the roofs are right nothing else will be. Fortunately, he is able to tell us how to make them right: "there are just two ways,"—one is always to make them of wood or stone and not of iron; and the next is, to take care that the little roofs are made before the big ones, and that every one who wants one has one. If you can make anything practical of that you are cleverer than I am; the second axiom is philanthropic enough, no doubt, but when an eminent critic tells us we do not know what to do with the roof, and he will tell us, and then presents us with a moral sentiment, it seems to me to do more credit to his heart than his head. Looking at house-roofs as they are, we can see that architecturally it is almost entirely a question of external effect, and that at present we are mainly dependent on timber framing and some sort of rain-proof covering,—slates, tiles, lead, zinc, or felt: the two former predominating. There are two distinct principles that may be followed in placing an ordinary roof on the walls: the one is to spread the roof over the wall so as to form a more or less overhanging cornice or "eaves"; the other is to keep it within the wall line and build a parapet round, so as either to hide the roof or make it look as if sinking down inside the building. The first of these principles is always right, the second nearly always wrong. The roof in this case is the lid of the building to keep out the wet, and you want it put on the top and overlapping, not fitted into the inside. A balustrade round a roof has no sense or fitness unless the roof is flat and is meant to be walked on. If the roof is not a flat one, it should, I think, always show so far as its pitch allows; it should never be artificially concealed. I observe a habit has come in lately, however, of using high-pitched roofs, but putting a balustrade at the foot. This is worse than all: as the balustrade is palpably useless, and contradicts the character of the roof. Now, as to the shape or outline the roof should take when it is visible, we know there is one fashion

peculiarly prevalent now,—that of a truncated cone. This, which arose in France, is in reality merely the old high-peaked chateau roof with the upper half cut off. The Mansard roof scarcely deserves either the practical admiration or the theoretical abuse it has received. It is not a beautiful form at all, but it has been very useful to modern architects when at their wit's end to reconcile piquant outline with economical considerations. The erection of such a mass of timber framing and slate covering at the top of a building, sometimes with two floors of rooms in it, is, however, inconsistent with safety from fire in towns, and still more with architectural dignity and solidity of construction. On the whole, if a high-pitched roof is desired, there hardly seems to be a better way of breaking it up into picturesque outlines than the old fashion of gabling, always provided that the gables have a distinct reference to the plan of the house, and are not invented for the sake of effect. Carrying the roof a good way beyond the walls, either at eaves or gables, I think only has a good effect with low-pitched roofs. In that case something of the piquancy which would be obtained by the high pitch is supplied by this picturesque extension of the roof horizontally; but this is a style of treatment unsuited for towns, and only in harmony with rather rural buildings, in which it often produces a very good effect. As to bargeboards and elaborate finials, they are things only fit to make firewood of; they are simply vulgar, and so are those growths of spiky ironwork we so often see sprouting from the roof. All such things are mere gimcracks, at variance with anything worth calling architectural character. For town houses I cannot help thinking that flat roofs deserve a great deal more attention than they have received. "Oh, but we want skyline!" will be an obvious objection. But it is useless to think of artificially cooking skyline; to do that is beginning at the wrong end. And in crowded towns those who have not any garden space where the sun will reach might find the flat roof an opportunity for an artificial garden much more extended than the little conservatories we see on the porch roofs, or hung from the sides of London houses; and roof parties might even supply the place of garden parties.

Roofs of this description would demand a more solid and homogeneous construction than the sloping roofs, and thus this brings us back to the point before dwelt upon, the desirability of making the roof as permanent as the walls, and of the same class of materials. Of the materials which are used to cover our wooden roofs, tiles are by far the most pleasing and approach most to the character of the materials of which our walls are generally built. It is ungrateful to abuse a material which has been so useful as slate, but it makes a most uninteresting cover to a building, and the very quality which has made it convenient and economical for use, its thin cleavage, gives it a flimsy and unsubstantial appearance. Zinc is too glittering for any repose of effect, but lead might, I think, be used ornamentally on sloping roofs more than it is, with good effect, where cost is not an object. In fact, the artistic capabilities of lead are under-rated with us, and its practical value over-rated, for a big "lead flat" is one of the greatest nuisances possible, most disagreeable to walk on, and always getting out of order. But the question for the future of town roofs is, whether we can contrive to build them in a more solid manner, consistently with economy; for whatever is done with town or street architecture, it is an inexorable condition that it must pay. I cannot attempt to consider the possible methods of such a reform in roofing; at the close of a paper already too long; it may be suggested that concrete, even if it does not attract much as a material for walls, may have a part to play in roofing; but I leave the question for more mature consideration, on your part and my own, as an important problem to be solved in the improvement of modern building.

#### Death of Mr. Joseph Warren, of Ixworth.

The death is announced of Mr. Joseph Warren, well known in the Eastern counties for his archaeological researches. He was born at Attleborough, Norfolk, May 17, 1792, and in March, 1818, removed to Ixworth, commencing business there as a watch and clockmaker. About 1828 he turned his attention to archaeological studies. He contributed an antiquarian map of Ixworth, with portions of Pakenham and Stowlangtoft, to the Proceedings of the West Suffolk Archaeological Society.

#### A MARKET TOWN WITHOUT THE RAIL: WOOLER.

In another quarter of a century, the number of our market-towns left at the stage-coach period,—that is to say, without a railway,—will, probably, be extremely small. It is not large even at the present day, but we have a few examples, and in them we may note the consequences of their isolation from the network of rails that has drawn so many other places nearer together within the last thirty or forty years.

Wooler is an example of the isolation in question. This was one of the baronies into which Northumberland was divided a short time after the Norman Conquest, and it was given by Henry I. to Robert de Musco Campo, or Muschamp. It lies at the foot of the Cheviot Hills, to the east of Cheviot, and close to a trout stream that winds about on a bright bed of porphyry boulders. It is the only market-town in the Glendale ward, being about eighteen miles distant from the nearest market-town either north or south, and about eleven miles from Belford, and is, consequently, the centre of a large tract of country. This tract is well farmed, and, in many respects, highly favoured, but the absence of the connecting link afforded by railways has entailed a very evident stagnation, both in the development and appearance of the town.

Twenty years ago the writer looked upon Wooler for the first time, and saw a small grey town of small grey houses and shops, and grey pebble footways, close under the grey and green hills of the district. In this grey town there was one wide, irregular street, which served also as the market-place, and in which stood the principal inn. This inn rose above all the other houses, for it boasted of two upper stories, both with a bow-window to them; but it was very shaky and aged, without being ancient enough to recall the old association of the place with Robert de Musco Campo, or, indeed, any of the successive barons who once lived in the ruined castle close by. A great fire raged in Wooler in the year 1722, and this date corresponds with the style in which the inn was fashioned: cosily, but with low ceilings, with here and there a beam depending, narrow ways, stout window-frames, small panes, and substantial balustrades to the dark stairs. The shops on either side and over the way were all small, and most of them were dull and dingy, though a few were bright and smart. A few openings to the right and left possessed a few more houses, and while a branching off of the main street led to the church at one end of the town, the last building at the other end was a lofty Roman Catholic place of worship. It was market-day, and the market seemed to be attended by less than a dozen farmers, none of whom apparently either bought or sold, for there was nothing visible for sale. The writer called to mind that this place was once famous for its large flocks of goats, and that invalids used to resort to it to drink goats' milk. A letter of Sir Walter Scott's is dated from Wooler, and states that he is staying there for that purpose, as a benefit to his health. But there were no goats to be seen. They and the invalids were all gone, and the little grey town seemed lost in a long day-dream. The writer called to mind, too, the reputation of a Wooler worthy, who, at the beginning of the century, enterprisingly discontinued the use of pack-horses for the transport of commodities, and organised a service of wagons, drawn by eight horses, for the improvement of the traffic of the district. But there was not a wagon to be seen. The stage-coaches from Berwick and Alnwick were left, horseless, before the inn windows, in company with a few farmers' gigs, likewise with their shafts thrown back; but there were no cracking of whips and tinkling of bells; no cries; no noises; rarely a footfall.

After twenty years, within the last few weeks, Wooler has been revisited. There were the same little low houses, the same shaky old inn, the same poor pebbled footways, the same dull and dingy shops here, and the same bright ones there; the same lofty Roman Catholic place of worship at one end of the town, and the same stiff and square church untouched, untuned, even by time, at the other. It was as though not a breath had stirred, not a stone been turned in all the twenty years,—with one exception. This exception has arisen out of the establishment of a branch to the Alnwick and County Bank, for which enterprise new premises have been built on the opposite side of the road to the inn, and not far from it. It was market-day again. About a

\* It seems to me deplorable that Albert Hall should not have been domed as a masonry or brick construction. There is every preparation for it; there is abutment enough between the double walls to carry anything; and it would then have been, even with all its faults of detail, a great building.—H. H. S.



dozen farmers passed in and out of the inn, or stood about the doorway, and one of them held in his hand a small bag containing a sample of corn, a handful of which he showed to two others who stood chatting with him. This was the only outward and visible evidence of any business transaction on this market-day, in this market-town for this wide countryside. Surely, in Robert de Muschamp's day there must have been as much going and coming, more clattering of horses' hoofs, more pomp and circumstance; for the barony was divided into as many as twenty-four members, and each division was held *in capite* by the service of four knights' fees. Surely, so recently as the days of the goat flocks and the invalids, there must have been more going on in Wooler than there is now. This quiet, this dead flatness, must be the result of being left alone, unconnected with the main arteries of the land, and is a fair sample of the unprofitableness of such seclusion.

A word as to the fabric of the church. It seems the barren, hard outlines are to be at last somewhat amended. Tracery is to be put into some of the ill-favoured square-headed windows. A gallery within is to be removed; and, eventually, a chancel is to be added. As it now stands, there are no aisles, no chancel, no porch, no pillar, not a buttress, or string-course; not a line, in fine, to cast a shadow, or make a break upon the spare rectangular block of excellent, but unmeaning, masonry. And at the foot of the rise on which the church stands, the stream we have mentioned purls and winds, and all round the horizon hill after hill breaks into fresh rising and falling outlines, setting the fairest example of movement and variety.

There is one more word to be said as to the consequences of being without the pale of railways, and this word is on the other side of the question. The old low prices for edibles still prevail at Wooler, or have been but comparatively slightly raised. Whereas the smart Railway Hotel, or Station Hotel, of the improving town, charges from 3s. upwards for a dinner, the old, last-century inn we have mentioned provides a good and substantial one, pleasantly served, for 2s., with a lower charge of 1s. 6d. for a post-boy's dinner. Though this is good news for the guest, it is, of course, of a piece with the limited fortunes of the place. Somewhat of the old spirit of Robert Muschamp, who was able to keep Wooler against the Scots and all comers, is evidently wanted at this day, at this place,—not, however, to keep comers away, but to induce them to come. Some strong, united effort should be made to secure the advantages of railway communication with the rest of the world, if the resources of the district are to be fully realised.

#### LIABILITY FOR THE DESTRUCTION OF COUNTY BRIDGES.

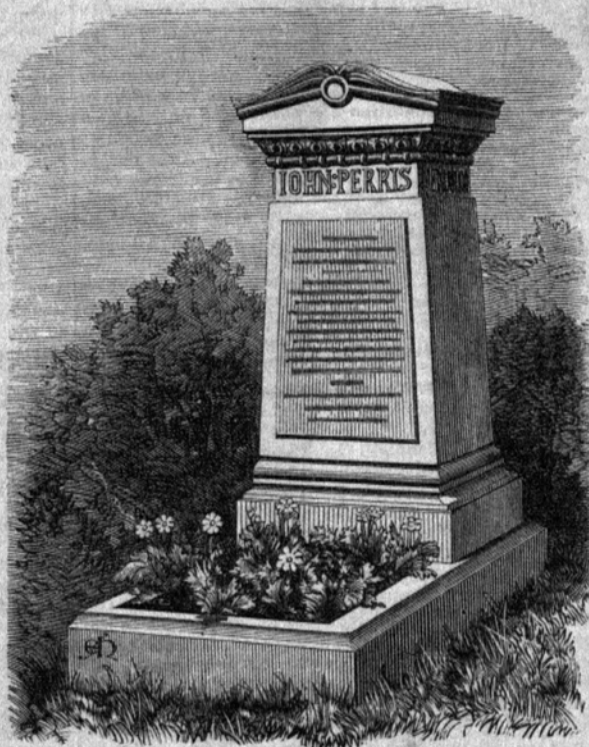
NICHOLLS v. MARSLAND.

On the 1st inst., in the Court of Appeal, Westminster, Lord Justice Mellish (with whom were Sir Balil Brett and Sir Richard Amphlett) delivered the judgment of himself, the Lord Chief Justice, Lord Justice James, Sir Richard Baggallay, and the late Mr. Justice Archibald, the learned judges before whom this case was argued. It was an action tried before the Lord Chief Justice and a special jury at the assizes at Chester, and was brought by the county surveyor to recover the cost of rebuilding nine county bridges which were swept away by a flood on the 18th of June, 1872. The defendant was Mrs. Marsland, the tenant for life of an estate near Macclesfield, and it was alleged that through her default the sweeping away of the bridges occurred. The jury at the trial found for the plaintiff, with damages 400l. A rule was subsequently granted by the Exchequer Division to set aside the verdict on the ground that the calamity had occurred, not by any default of the defendant, but by the act of God. That Court gave judgment in the defendant's favour, and their decision was now affirmed.

#### MEMORIAL OF A LIBRARIAN.

We give an illustration of a sepulchral monument to the late Mr. John Perris, who was for fifty years librarian of the Liverpool Lyceum. It is erected in the Toxteth Park Cemetery, Liverpool, and is well placed near the entrance in Smithdown-road. The material employed is hard Yorkshire stone. The design, which is in the form of a Greco-Roman altar, is of simple character, and consists of a deep plinth and base supporting a large block forming the die, into one side of which is inserted a polished granite slab, containing the following epitaph, written by Mr. Charles Dyllal, and inscribed in sunk and gilded letters:—

"Faithful to his trust, his duties were his pleasures. The student and the scholar are his debtors for valuable aid cheerfully rendered.



His long, useful, and honourable career endears his memory to numerous friends, who have erected this monument in testimony of their affectionate regard."

Around the necking of the cornice in large raised letters are the words:—JOHN PERRIS, DIED JAN. XXII., MDCCCLXXII. The whole is crowned by a pediment shaped like an open book as an appropriate symbol, and may be considered to be a successful blending of the realistic with the æsthetic. A dwarf stone kerb, enclosing some flowering plants, surrounds the grave.

The designs were prepared by Mr. Edward A. Heffer, architect, Kilburn.

#### THE NEW TOWN-HALL OF ERFURT.

As the history of the city of Erfurt, situate in the heart of Germany, and being one of the oldest towns of that country, is lost in the dim past, so the information regarding the origin of its principal buildings, of its churches, convents, and secular structures, is as precarious. As early as 954 A.D., when the Emperor Otto the Great granted certain privileges respecting Erfurt to his son, Archbishop Wilhelm of Mainz, a town-hall is said to have stood "on the street" (now called Market-street) leading from the oldest part of the city to the square in front of the cathedral. It has been proved that on the site now occupied by the new town-hall there stood in 1175 a building for municipal purposes, later chroniclers referring to a great fire extending as far as the town-hall. We learn further from old chroniclers that the town-hall was used already before 1258 as a house of assembly, or "Spielhaus" (modern German *Spielhaus*, playhouse, used for dancing and other festivities), in which Archbishop Gerhard of

Mainz is reported to have handed over the care of the administration of the city to a council consisting of twelve noble citizens, and owners of neighbouring villages and two aldermen, to whose number were added later four representatives of the commune. In 1330 the treasury buildings and the tower adjoining it, with walls 18 ft. thick, were commenced. The latter, however, was left unfinished. There are later records of additions, alterations, and rebuilding; and thus the venerable pile, in the large halls of which many historical banquets were held, weathered all the storms of succeeding centuries until at last it had more the appearance of a ruin threatening to fall down than the meeting-place of the representatives of a city of 40,000 inhabitants. When, in 1830, in consequence of the outbreak of the French and Polish revolutions, industry and trade in Germany were

almost at a standstill, the town-council of Erfurt, to find employment for the numbers of idle hands, came upon the idea of providing work for them by having old buildings pulled down, the tumble-down town-hall being one of them; but its demolition was not completed until 1866. In 1830 a fund for a new town-hall was formed, which, by donations, legacies, and accumulation of interest, had grown in 1869 to 110,000 thalers (16,500l.).

By that time the necessity of erecting a new town-hall had become imperative, for the Erfurters had then actually none, and the municipality resolved at last upon building. Among the seven designs sent, they chose that of the architect Sommer. The new town-hall of Erfurt, the subject of our illustration, is in the Gothic style, corresponding to the general character of the city. This style offers not inconsiderable difficulties for secular buildings to the architect. German domestic architecture of the Middle Ages has nothing of the showy decorative abundance of that of the neighbouring countries, nothing of the uncertain seeking after rules for ground-plan and building; the usual Gothic style of Germany is simple, animated by one law. This is testified by the town-halls of Brunswick and Münster, the houses of Nürnberg, the beautiful castles of the Prussian Order of Knights.

The architect of the Erfurt town-hall followed this German style, combining with it, however, an excellent element of Venetian Gothic: those open pointed-arch galleries in the ground-floor of the façade on the Marktstrasse, behind which is a row of shops. This part is interesting from the circumstance that the principle of an exaltation of the open arcade, which during the Middle Ages was only timidly attempted for instance in the town-hall of Münster, has been resolutely, and consequent with and in close relation to the other parts of the building, carried out for the first time in a secular building of German Gothic. The back part of the building contains the municipal offices, the upper story the rooms of the town councillors. Corresponding with their more practical purpose, their outside is more sober in keeping as compared with the elaborate principal front, behind which are the rooms devoted to civic festivities. On this side, the narrow front of the building facing the Fischmarkt, is the open porch, with three entrances, occupying the centre three-fifths of the façade. Over this is the large hall, with three groups of windows, arranged in accordance with the window system of the aisles of Regensburg Cathedral. The two buttresses between the groups of windows bear upon corbels of original construction, under neat canopies, the statues, double life-size, of the present Emperor, William I., and of old Frederick Barbarossa, two fitting representatives of the new and the old German empires. The centre window is surmounted by the arms of the city, on both sides of which are battlements, the side gables towering over the other roofs. Thus this centre part shows also outwardly its festive character, by further masses extended forward and aloft, which contribute principally to the





THE NEW TOWN-HALL OF ERFURT, GERMANY.—HERR SOMMER, ARCHITECT.

imposing impression of the town-hall perspective. The two other façades of the building, because they front narrow streets, are more simple, but are still in harmony with the style characteristic of the whole structure.

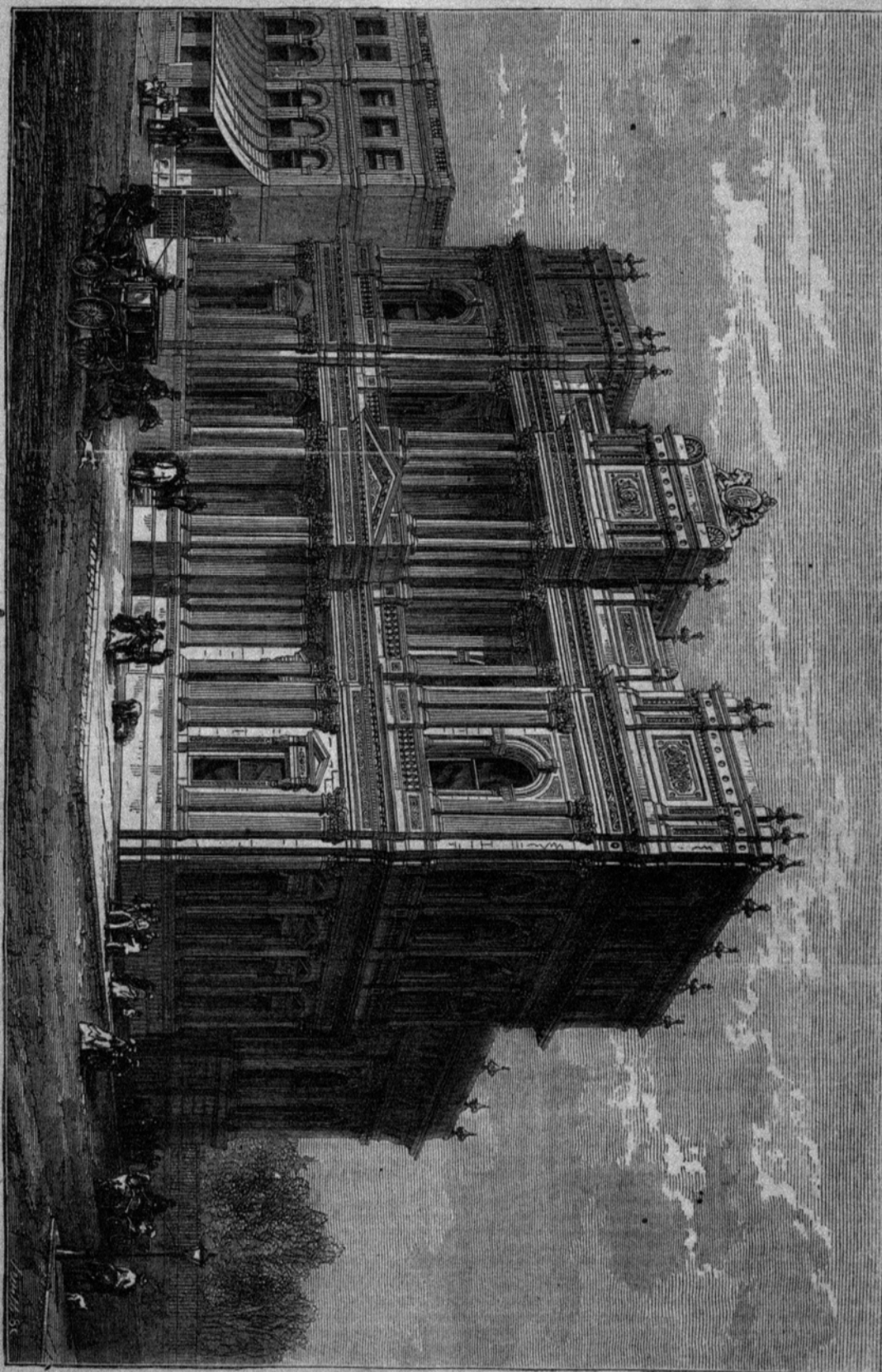
The arrangement of the ground-plan is of no less interest to connoisseurs than to persons not learned in architecture. In the vestibule may be recognised a subtly and practically transformed reproduction of the trefoil-like plan of Rhenish Gothic churches. It forms the entrance to all the stairs, rooms, and corridors of the building. The three aisles, to continue the comparison with Rhenish church architecture, correspond exactly to the treble outer porches, and form at the same time a delicate and simple mediation between the exterior and interior architecture. The constant trisection continues

through the whole staircase as far as the great foyer of the large hall. Imposing staircases, as used during the Renaissance and the modern time, are scarce during the Middle Ages, which have only narrow winding stairs and large fliers, but no staircases in the modern sense. The stairs in Oxford University and in the castle of Meissen (Saxony) cannot be included. In consequence of the little disposable space that could be spared in the town-hall of Erfurt and the low corridor of the ground-floor, the construction of the staircase had to be attained at the expense of symmetry. The continuation of the stairs in the upper staircase, everywhere free and high, in connexion with the foyer of the large hall, on the contrary, is one of the most successful parts of the building. This foyer, forming a large hall of three aisles, with its

delicate and slender pillars, arches, tracery, the picturesque openings, is a unique piece of work of its kind. The great hall, of nearly square form, is still unfinished, and will be decorated, like the larger wall spaces of the staircase and the foyer, with fresco paintings representing scenes from the history of Erfurt, the means for which have already been provided. The ground-story, on the side facing the market, has been fitted up for a restaurant, in which a flourishing trade is carried on.

The new town-hall of Erfurt, besides the ten shops in the ground-floor, and the rooms for a commissary of police and a housekeeper, will contain four large halls as well as fifty-four rooms for offices. It has cost the sum of 750,000 marks (37,500*l.*), including the cost of furnishing.





THE BANK OF SOUTH AUSTRALIA, ADELAIDE.—MESSRS. LLOYD TAYLER AND J. W. WRIGHT, ARCHITECTS.



### THE BANK OF SOUTH AUSTRALIA, ADELAIDE.

THE important building for the Bank of South Australia in Adelaide, of which we give a view, well illustrates the extent to which our colonial brethren are competing with the palatial buildings in the United Kingdom. The design was selected after competition among all the Australian architects, and is being carried out on a fine site situated in King William-street, the most important thoroughfare in the city of Adelaide. The building is faced throughout with stone from Australian quarries. It contains, on the principal floor, the banking-room, 67 ft. long, 42 ft. wide, and 32 ft. high, lighted by eleven large windows, fitted with embossed plate-glass of handsome design, protected by ornamental wrought-iron guards, and having the walls enriched with panelled pilasters and arches, with coupled Corinthian columns, with entablatures to the windows, massive ornamental consoles, and a deeply coffered and enriched ceiling. The floor of the public space will be of Sicilian marble squares laid diagonally, with polished black marble dots at the junctions, and a bold fret border all round. The fittings embrace a recessed and enriched counter front, with carved consoles and moulded framing, with the upper parts filled in with ornamental bronze panelling. The approach to the public room is in the centre of the building through the vestibule, in which are detached columns and pilasters of fine Devonshire marble, with alabaster capitals, and a variegated marble dado on all sides. There are also some beautifully sculptured panels in the vestibule illustrative of the history of the colony, executed by Mr. Joseph Durham, A.R.A. The floor will be paved with marble to correspond with the banking-room. To the left of the entrance are the board-room, private entrance, and stone staircase. In addition, are ante-room, messengers' rooms, and second staircase; while on the right are the manager's and assistant manager's rooms, inspectors', clerks', and waiting rooms. The principal rooms are floored with Arrowamith's parquet, and the private entrance-hall and passages with Minotaur's ornamental tile-paving. The basement story, which is constructed in the securest possible way, both as regards fire and burglary, and occupies the entire area of the bank, contains strong-rooms in profusion, voucher-rooms, securities room, &c., surrounded by a patrol-passageway. This portion of the building will rival many of the best strong-room arrangements in England. The first and second stories of the building are devoted to resident officers' apartments, and have every modern requirement; parquet has been extensively used in the floorings. The banking-room is heated by hot water, and the other portions of the building by ordinary fire-places. The various internal fittings, electric bells, heating apparatus, &c., are all of modern character both in style and construction, having been sent out from this country.

The colonial architects are Mr. Lloyd Tayler, F.R.I.B.A., of Melbourne, and Mr. E. W. Wright, of Adelaide. The contractors for the general works are Messrs. Brown & Thompson.

It may be added that all the requirements from England have been specially designed or selected by the Bank's London architect, Mr. Ebenezer Gregg, who has also furnished the complete designs for the internal fittings.

### ARCHITECTURE IN LEITH.

LEITH, like most of the old towns on the seaboard of the Frith of Forth, possesses some remains of quaint street architecture of a style which was influenced by that of the low countries with which the bulk of the traffic was carried on. Little care has been taken to preserve these remains, and some of them (notably a remarkably picturesque tower near the harbour) have been swept away.

A few attempts, and these not very successful ones, have been made to impart to new erections somewhat of the character of the old, but they are, without exception, forced and overdone. Most of the modern street architecture is, however, of the Vernacular type, and the public buildings, with the exception of some of the churches, are Italian in style. The Trinity House, situated in the Trongate, the commercial centre of the town, is in this style. The authorities of the Trinity House recently disposed of some dilapidated property adjoining that building, and a large block, to be called Trinity

chambers, now occupies the site, and is in course of completion. The new buildings are of dressed stone, and comprise a basement, four shops on the ground-floor, and two stories and an attic above. In the centre of the shops there is a doorway, giving access to the flats above, it is arched over, and has shafts of polished Peterhead granite in the ingoing with carved caps and an enriched architrave. All the window openings are spanned by semicircular arches, springing from red granite shafts with carved caps. The flanks of the first-floor are varied by oriel windows being projected over the shops. A cornice of good depth, with moulded corbels, runs along the wall head, and the attic windows are grouped so as to produce an effective skyline.

The thoroughfare of the Trongate being rather narrow, an arrangement was made whereby the new building is placed 7 ft. back from the old line of frontage, by which means a desirable improvement has been effected. The buildings were designed by Mr. R. Thornton Shiells, of Edinburgh.

### ELECTION OF A DISTRICT SURVEYOR.

At the meeting of the Metropolitan Board of Works, on the 8th inst., the first business on the agenda was to receive applications from candidates for the appointment of district surveyor for the district of Bethnal-green (East), vacant by the death of Mr. R. Culver James, and to proceed to the election. There were twenty-seven candidates, whose names, and the number of votes received by each in the first voting, are as follow:—Messrs. A. Allom, 8; T. Blashill, 31; A. Bovill, 24; E. Carritt, 17; J. Clarkson, 24; H. H. Collins, 15; A. Conder, 3; J. M. Ferguson, 10; V. J. Grose, 25; F. Hammond, 11; J. Hebb, 5; F. W. Hunt, 18; W. A. Large, 17; W. C. Leonard, 3; G. McDonell, 14; A. Millwood, 4; A. Payne, 18; J. S. Quilter, 11; L. W. Ridge, 7; W. Seymour, 5; T. Stone, 12; W. Tasker, 23; F. Todd, 9; F. Wallen, 22; T. Williams, 17; T. W. Willis, 15; and J. Young, 13. The number of candidates was then reduced to the six who had received the highest number of votes, viz., Messrs. Blashill, Bovill, Clarkson, Grose, Tasker, and Wallen; and the second vote was taken as follows:—Blashill, 29; Bovill, 25; Wallen, 22; Tasker, 18; Clarkson, 15; Grose, 15. On a vote being taken as to which of the latter names should be struck off, the votes for retaining the names were,—Grose, 17; Clarkson, 15. Mr. Clarkson's name was therefore struck off. In the third vote the numbers were:—Blashill, 31; Wallen, 24; Bovill, 20; Tasker, 19; Grose, 9. Mr. Grose's name was struck off, and the fourth vote resulted as follows:—Blashill, 29; Bovill, 21; Wallen, 21; Tasker, 15. Mr. Tasker was therefore out of the running. On the fifth vote, the numbers were:—Blashill, 29; Bovill, 19; Wallen, 18. Mr. Wallen's name being dropped, the contest now lay between Messrs. Blashill and Bovill. The final voting was:—Blashill, 31; Bovill, 9. Mr. Blashill was therefore declared duly elected, subject to the usual conditions, viz. :—

"That the appointment of district surveyor be subject to the condition that he shall make no claim for compensation in case a diminution of income shall at any time hereafter arise from any reduction or alteration of fees by the Board, or from any change of system which may be adopted, either as to the office, its duties, or emoluments, or from any division, reduction, or re-adjustment of districts.

That the appointment of district surveyor be subject to the condition that he shall furnish the Board with information of those cases in his district in which the orders of the Board, or the requirements of the Local Management Amendment Act, 1862, with regard to the width or entrances of streets, or to any building, structure, or erection, or projection therein beyond the general line of buildings are not complied with, and of those cases in which the limitations contained in the building Act, as to the cubical contents of buildings, are exceeded.

That the district surveyor be required to keep his district office open, daily, from ten a.m. until four p.m."

**Bromley Science and Art Classes.**—The annual meeting and presentation of prizes in connexion with these classes was held recently, at the Town-hall, Bromley. Mr. E. H. Scott presided, and incidentally stated that he had last year great happiness in showing his desire to encourage the classes by a gift of 400*l.*, the interest of which was to be devoted to the purchase of prizes for successful students; but it was now his intention, by the addition of 600*l.*, to make the foundation (with the sanction of the committee) of a School of Art. The report, read by Mr. T. Davis, one of the honorary secretaries, recorded much useful work. Dr. Puckett is the head-master.

### THE ART-UNION OF LONDON.

THIS Society,—following its general rule of constantly changing the *pabulum* provided to satisfy the yearly-reviving appetite of its subscribers, and diverging widely in subject from the works of the last two years, which portrayed two most important events connected with the career of England's greatest captains, the victories of Trafalgar and Waterloo,—now selects for its annual plate a far different scene; and, in the words of the Council's report, "addresses a far larger circle; it strikes a chord to which the soul of all Christendom must respond, leading up as it does to one of the most important epochs of the Saviour's life on earth,—the first occasion, namely, on which he appeared as something beyond 'the carpenter's son' dwelling under a lowly roof in Nazareth. At the close of the scene represented in the picture, it is recorded, as the first instance of any peculiarity in the child's nature, that he was found sitting in the midst of the doctors, both hearing them and asking them questions." While, some three years since, the subject chosen was Mr. Goodall's charming picture of "Rebekah at the Well,"—of her who seemed to express, by her looks, a kind of inspired awe at being chosen as the one who was destined to be the mother of "thousands of millions," and in whose seed should "all the nations of the earth be blessed,"—we had one of the most important events described in the Old Testament; we must now go forward nearly 1,900 years, and find, in the present subject, from the New Testament, an incident of the foreshadowed event.

Joseph and Mary, with their friends and kinsfolk had gone up to Jerusalem, according to the annual custom, to be present at the great Feast of the Passover, in the Temple; and on their return, in the course of the second day's journey, not finding their son in the company, they set out to return to Jerusalem seeking him. The moment selected by the painter is that in which, arrived within the walls of Jerusalem, Mary, weary with the prolonged journey over the hot plain of Palestine, and fearfully anxious lest the child might have been kidnapped by some of the tribes which constantly roved through the country, leans on the edge of the fountain, and seeks from the women who come to fetch water for tidings of her son. We are not prepared fully to endorse the opinion expressed in the Council's report, that the figure of Mary "will compare not unfavourably with the conceptions of Raffaele himself," but there cannot be any doubt as to the touching sentiment, as well as feminine loveliness, in Mr. Armitage's representation of the Virgin Mother.

As to the interpretation of the picture by the burin of Mr. Jeens, we cannot bestow on it higher praise than is conveyed in a letter of Mr. Ruskin to the engraver, in which he calls it a "marvellous engraving," and says, "I hope you will derive some pleasure from my fervent admiration of your work, and the extreme interest taken in it, and the subject it illustrates, by my pupils."

We are informed that the impressions of the plate will be ready for the subscribers on the 1st of February next.

### GRANITE BUILDING.

CONTINUING our remarks on this subject, it may not, perhaps, be uninteresting to notice a few Mediaeval works in granite. It is, we believe, a somewhat prevalent idea that these exhibit in their design a necessary regard for the intractable nature of the material, and that their general character is bold and simple. Probably the greater number of ancient granite buildings have this character; but it is certain that the more notable examples of churches are particularly rich and ornate, and appear to prove that religious zeal was sufficient in those days to overcome all the practical difficulties in working the material with very inferior tools and machines to those of the present day. Granite is comparatively soft when immediately quarried, and probably advantage was taken of this, induration taking place after the details were worked.

The Church of St. Mary, at Launceston, in Cornwall, is one of the most elaborate Tudor buildings ever erected. Not only are jambs, arches, buttresses, cornices, and parapets, handsomely moulded as usual in this style, but every stone of the ashlar has some ornament or device carved upon it. The ancient cathedral of Aberdeen, dedicated to St. Machar, is the only



cathedral in Great Britain constructed of granite; but the following buildings are of this material, viz.:—Craigievar, Drum, and Crathes Castles in Scotland, and Harlech and other castles in Wales, and the buildings on St. Michael's Mount, in Cornwall. Brittany may be said to be the home of granite building, rich in details, and ranging in date from the twelfth to the sixteenth century. The Church of St. Thegonec is exceedingly handsome, and the churchyard is surrounded by singular buildings, forming a picture of extraordinary architectural richness. At the entrance is a triumphal arch, elsewhere an ossuary, calvary, &c., all in granite. Notre Dame de Folgoat is a fine Middle Pointed church, with transepts, west towers,—one with a spire,—and two magnificent porches, executed in Ker-santon stone,—a nearly black basalt, harder than granite to work, but imperishable. The east window is a large circle filled with beautiful tracery, with an open arcade below. Here, externally, in a recess with carved and moulded jambs and a figure of the Virgin, is a holy well. This, according to an inscription, was the cause of the erection of the church.

The granite cathedral of St. Pol de Leon is very complete; and, in addition to western spires, has an eastern chevet and radiating chapels. The western arch of the transeptal crossing carries a large stone sanctus bell-cot, and there is an external gallery at the west end for giving the episcopal benediction.

The Collegiate Church at St. Pol de Leon (Notre Dame de Kreisker) has a central spire said to be 400 ft. high. It is said to have been built by an English architect invited to Brittany by Mary Plantagenet, daughter of Edward III., who had married one of the dukes.

Many other granite buildings in Normandy and elsewhere might be mentioned, but those we have referred to are sufficient to show that in a past age when tools and machinery were very primitive as compared with those of our own times, the workman had no hesitation in carrying out the most elaborate designs in this hard but most enduring material.

SIR.—In a letter addressed to you last week on this subject, Mr. Trickett says,—“It is a pity that parties who supply polished granite do not recommend their clients to wash it at the same time that they wash their windows, for then,” he adds, “it might be said of it,—

“A thing of beauty is a joy for ever.”

This, at all events, is not bad praise, the washing notwithstanding; and as any one can decide for himself whether polished granite really does require any more washing than it gets from occasional showers of rain, by taking a walk of ten minutes round about the Exchange, it is not necessary to discuss the question at length,—a few words will be sufficient. Where rain has access to it, it is as clean as anything can be in this mundane city that does not receive constant attention. Under cornices or other projections, the polish is temporarily deadened, and it would of course be well if owners or tenants would have these parts washed with a sponge occasionally, which is all that this hard, unabsorbent material requires. It is a pity that beautiful moulded and carved details in stone cannot be as easily cleaned.

The desirability of using polished granite for the façades of London buildings is a question of means to ends. It is perfectly well known and acknowledged that stonework is utterly spoiled by soot-absorption. New Portland stone is white; but, with about a year's exposure, the small portion of the New Law Courts already built may be said to be almost black from this cause. Ordinary bricks are little better than stone. Glazed bricks, though not absorbent, are unsuitable for a building of any architectural pretensions, and, therefore, polished granite is the only available substitute for stone if we are determined that our buildings shall look as well years after they are finished as when just completed. This is assuredly a desirable aim. At the present day the cost would be little, if anything, in addition to elaborate stonework, because the various colours of polished granite judiciously disposed by a competent designer would be almost sufficient without further ornament; but, if considered necessary, the incised work seen at Aberdeen would not be expensive, as compared with stone carving, as it can be executed by the steam sand-blast. The result would be, that instead of Cimierian dullness reigning in our streets, we should have cheerfulness, richness, and cleanliness; and perhaps it is not too much

to hope that we should be impressed with the truth of Mr. Trickett's quotation. If, however, while we are waiting the advent of the new architectural era, Mr. Trickett can persuade his own clients to clean their moulded and carved stonework he will do immense service in improving the present dingy appearance of London streets; but,—as nobody knows better than himself,—cleaning stonework is a very different thing to cleaning polished granite. It has been done at a church in Regent-street, and at the Fountain in George-street, Westminster, at considerable cost, and it may be feared it is not likely to be frequently adopted, however necessary it may be.

AN ARCHITECT.

#### ARCHITECTURAL ASSOCIATION.

At the ordinary fortnightly meeting of this Association, held on the 8th inst., Mr. H. C. Boyes, president, in the chair, the following gentlemen were elected members, viz., Messrs. G. A. Waters, S. Burmester, B. Daniell, H. Taylor, W. E. Mills, E. C. Shearman, R. T. Morris, E. W. Rich, and H. Russell.

Mr. T. N. Laslett read a short paper descriptive of a new instrument of which he is the inventor and patentee, and to which he has given the name of “metroscope.” Mr. Laslett said that in the ordinary practice of every architect it often occurred that existing buildings had to be measured, both for plans and elevations. The plans were easily got at, but it was often a difficult matter to obtain the elevations. The means now resorted to for obtaining the necessary dimensions were such as measuring from ladders, counting the courses of bricks, or clambering over roofs and along ridges, and dropping a tape over while an assistant read it. These methods were more or less accurate, but they were troublesome and even dangerous. The metroscope was designed to obtain the same results more exactly and conveniently. It was intended not only for the measurement of heights, but afforded a means of performing much, if not all, of the instrumental work required in ordinary practice, such as levelling, laying out off-sets, and measuring distances. Of the instruments at present in use for measuring purposes, the most important, next to the expensive theodolite, was the sextant, but there were two objections to its use. In the first place, it measured by degrees, and so rendered necessary calculations or a table to convert degrees into lineal dimensions; and in the second place, the angle subtended by a given dimension varied with its height, i.e., 10 ft. at the base of a building would subtend a greater angle than 10 ft. at the top. Seeing that these objections applied to all instruments reading by degrees, and believing that an instrument, to be of practical use, must be as simple as possible, Mr. Laslett has adopted, in the metroscope, the principle of measuring by two similar triangles, the smaller of which is made on the instrument. In order to measure an inaccessible height, such as the top of a chimney-shaft, two things must be known: its horizontal distance from a given point (called the base-line), and its degree of elevation as seen from that point, which Mr. Laslett calls its “reading,” as it was not marked in degrees on the instrument. For measuring an inaccessible distance, readings must be obtained from two suitable points, the distance between which would form a base line. Sometimes this base line formed part of the instrument itself, when it was of course very short, and could only be used for short distances. The metroscope allowed of the choice base line in three positions: firstly, in a vertical line; secondly, lying in the direction of the distant mark, and whether level or not; and thirdly, horizontal, but at right angles to the direction of the object. The metroscope was also useful as a level and as an optical square.

Mr. H. H. Statham then read a paper “On the Architectural Treatment of the Roof,” which will be found on another page.

In the discussion which followed, Mr. Sulman said he had been much interested in Mr. Statham's suggestions for making dome or vault coverings of permanent material, but he failed to see that much was to be gained by such a method. Would such a method of construction be taken for what it was by the observer: in other words, would the *ensemble* bespeak the construction? He thought not. As far as its appearance externally was concerned such a roof might just as well be of the ordinary construction. The chief difficulty in making the external covering of a dome or vault homogeneous with

the dome or vault itself, in accordance with Mr. Statham's suggestion, was that the architect would be forced to remodel the whole of his design. As to the use of iron, it was almost impossible to make a stable roof without it, and he (Mr. Sulman) could not see the objection to its use in the form of ties providing that its junction with the wood was shown, and so that everybody could see what it was. He begged to propose a vote of thanks to Mr. Statham for his interesting paper.

Mr. E. B. Ferrey, in seconding the vote of thanks, said the paper was so full of suggestive-ness and originality that it was difficult to say anything about it. He could not see any objection either to iron ties or to panelled roofs. When iron ties were used, of course they should not be gilded and made ridiculous for the purpose of attracting attention. In Italy the use of iron ties in roofs was quite common, and he never heard any one complain against them. As to panelled roofs, they were almost a necessity in this country, inasmuch as they made buildings covered with them warmer in winter and cooler in summer than would be the case with roofs open to the ridge. Another advantage of such roofs was that they afforded scope for colour decoration, a matter of great moment now that it was beginning to be generally recognised that churches and other buildings need not of necessity be always bare and Puritanical in internal aspect. He heartily seconded the vote of thanks.

Mr. S. Flint Clarkson said it could not be denied, he thought, that buildings which were roofed with identical or analogous material to that of which their walls were composed were more monumental in appearance than when totally different materials were used for walls and roofing. Buildings constructed and roofed entirely in stone seemed to impress the beholder with a sense of eternity, which was wanting when identity of material was not maintained. He had been much struck with this during the Charente excursion of the Association, when the church at Plassac was visited. He was disposed to fight vigorously against Mr. Statham's suggestion for abolishing the transverse rib in quadripartite vaulting. Even if it were not constructively necessary, it had the great advantage of being a ready means of dividing a long building into distinct bays, which was in accordance with the idea of subordination in design seen in all Mediaeval work. With reference to the use of wooden vaults, he thought they were not so utterly indefensible as Mr. Statham would wish to make out. He (Mr. Clarkson) had always regarded with some species of satisfaction one argument used in their favour, viz., that the Mediaeval architects could, on occasion, put up with make-shifts. He demurred to the dictum that a balustrade or a parapet at the base of a steep roof was an utter absurdity, for such features would at times save the passer-by from being buried in an avalanche of snow, and might occasionally prevent a stray slate from descending and guillotining him. Flat roofs on ordinary residences would be much more desirable if the ingenious suggestion could be carried out of conducting all our smoke away, as we conducted our sewage, and discharging it from one monster chimney at Purfleet or elsewhere, unless it could be destroyed or profitably utilised. At present, the chimney-pots of London militated against the enjoyment of roof gardens. A great deal of ridicule had been incurred by architects fifteen or twenty years ago by the absurdly-steep pitch they considered necessary for roofs of rustic buildings.

Mr. White could not help agreeing with Mr. Statham in thinking that concrete would eventually become a material much used for roofs and domes. It was well known that the dome of St. Paul's consisted, in reality, of two domes besides the intermediate cone; while the dome of the Invalides in Paris was made up firstly of a perforated dome, then another dome, then a forest of woodwork shaped externally like a dome. He had sat upon the top of that dome, when the lead was last repaired, and could testify to the fact that the oak woodwork had simply eaten into the lead which covered it, and the whole of the lead had lately to be removed and replaced. Surely domes might be built in England in concrete exactly similar to that of the Pantheon at Rome. He was quite sure that there were at least half a dozen special contractors in London alone who would be equal to the task if called upon. In India, on the plains of Delhi, domes were built in the twelfth, thirteenth, and fourteenth centuries, which looked very well exter-



nally as well as internally. There was no deception about them, and they looked like what they were,—honest constructions. True, they had no terminal feature surmounting them. Concrete roofs would certainly be far preferable to the vernacular expanded V roof of the speculating builder; and the distinction between the speculating and speculative builders should always be borne in mind. On the question of roof and skyline, it might perhaps be permitted to refer to the roof of the *Times*' offices. Looking at the top of that building some months ago, it was possible to see only a pediment, half the span and twice the pitch of that of the Parthenon. This pediment contained on the front a clock, and some leaves of the *Wellingtonia gigantea* and other colossal plants; but it had nothing whatever behind it. In a paper which he had read at the Institute about two years ago, on "The Hope of Architecture," and the *Quarterly Review*, he had wished, he said, to criticise that pediment, because he knew it had not been designed by an architect. The authorities at the Institute, however, forbade him to say anything about it, because they did not wish to offend the *Times*. Since then, however, the error had been admitted, and the space behind the pediment in question had been roofed in by slow degrees.

The vote of thanks to Mr. Statham having been carried by acclamation, and the Chairman having made a few remarks, Mr. Statham briefly replied on the discussion, and the proceedings terminated.

#### A HOUSE PURCHASE AND IMPROVEMENT COMPANY.

A COMPANY was some time ago formed consisting of city merchants and others, amongst whom is Mr. Sutton Gover, chairman of the London Markets Committee, Mr. Aste, chairman of the London Corn Exchange, &c., the objects of which are, as stated in the prospectus, the purchase and selling of productive and progressive house property, and also for improving the dwellings of the working classes, on the self-supporting principle. The capital of the company is 1,000,000*l.*, in 40,000 shares of 25*l.* each. One condition is that the amount of the shares is to be fully paid up as they are issued. It appears that the first issue of shares was 4,000, upon which the full amount of all the shares has been paid up, and thirty-seven different estates, at a cost of 75,000*l.*, have already been purchased. Whatever the company may yet have done in improving dwellings it would appear that it has so far been financially a success, inasmuch as at Michaelmas last interest at the rate of 5 per cent. per annum was paid, and in addition to this a bonus is about to be declared which will increase the dividend receivable by the shareholders to 8 per cent. This has had the effect of bringing up the shares to a premium. Last week a number of new shares were allotted by the directors, and they were immediately afterwards at a premium of 1*l.* per share. We know nothing of the management of the company.

**Royal Academy Prizes.**—The annual distribution of prizes to the students of the Royal Academy Schools was made on Saturday last. No gold medals were given this year. Two new prizes had been instituted experimentally, viz., a silver medal for a cartoon of a draped figure in chalk or charcoal, life size, subject given, "Boadicea"; and a silver medal for a design for a coin, subject, "The Two Faces of a Crown-piece of the present Reign." The following is the prize list:—Architectural Travelling Studentship, Thomas Manly Deane; Cartoon of a Draped Figure, silver medal, Frederick Hamilton Jackson; Painting from the Life, silver medal, Henry Gibbs; ditto, extra silver medal, Walter Charles Horsley; Copy of an Oil Painting, silver medal, Janet Archer; Design for a Coin, silver medal, not awarded; Drawing from the Life, first silver medal, L. Lexden Pocock; ditto, second ditto, H. H. La Thangue; Model from the Life, first silver medal, Will. Silver Frith; second ditto, not awarded; Architectural Drawing, first silver medal, Sydney Vacher; second ditto, Eley Emlyn White; Drawing from the Antique, first silver medal, W. Ganning King; second ditto, Edgar Hanley; Model from the Antique, first silver medal, James Stirling Lee; second ditto, not awarded; Drawing executed in the Life School during the year, premium of 10*l.*, P. Homan Miller; ditto, extra premium of 5*l.*, Stanhope A. Forbes.

#### THE PAST AND PRESENT OF ARCHITECTURE IN IRELAND.\*

THE subject on which I propose to address you this evening is "The Past and Present of Architecture in Ireland," and I may possibly add some anticipations as to its probable future. Recognising the presence of so many who, though taking an interest in our art, are not professionally connected with it, it seems most fitting that I should endeavour to deal with the subject in a popular rather than a technical manner. The details of architectural practice, the troubles and difficulties experienced by its professors, however fitting subjects for papers and addresses to be read before purely professional audiences, can hardly be of much interest to the general public; the results of that practice as they appear in the buildings of past and present times must command the attention of all who may be possessed of intelligence and taste. The controversies which agitate the surface of the architectural world are not altogether unimportant to the public; above all, the hard-fought "Battle of the Styles" still waged, with doubtful result, and which, if ever decided, must be by the verdict of the public, and not of architects.

When we contemplate the past of Irish architecture it is necessary to limit the field of observation somewhat, and to relegate a long period to the region of antiquarian rather than architectural interest. Our national poets have been wont (like poets, as usual) to sing of the glories of former times compared with the degeneracy of later ages. Those nations of the world whose past has been great and glorious have generally some other evidences of it besides poetic rhapsodies, and amongst these none are more enduring or conclusive than architectural monuments. Tried by this standard, we must admit that the remains of what I shall call the first period of Irish architectural history, namely, that prior to the Anglo-Norman invasion, do not attest any such great or glorious age as some of the poets would have us to believe; but, nevertheless, they are of deep interest to the antiquary, and we are especially indebted to our countryman the late Dr. Petrie for his investigation and illustrations of them. Other labourers in the same field have followed,—some extending their investigations to later periods; amongst whom Mr. George Wilkinson, the Earl of Dunraven, Mr. Marcus Keane, and the late Mr. Richard Rolt Brash, of Cork, deserve honourable mention. I understand that an important work of the last-mentioned lamented gentleman remained unpublished at the time of his death, which it is to be hoped will appear ere long. One of our members, Mr. Arthur Hill, of the same city, has devoted much time and attention to the geometrical delineation of these monuments, and has published clear and complete measured drawings of Cormac's Chapel, Ardfer Abbey, and other churches. Another young Irish architect has carefully measured and published drawings of Holy Cross Abbey, county Tipperary,—a most interesting specimen of the ecclesiastical architecture of Ireland during the Mediæval period, or that between the Invasion and the reign of Elizabeth. It is much to be desired that these separate and scattered illustrations could be collected and added to, so as to present a complete series of illustrations of the ancient and Mediæval architecture of the country, to do for it something like what the works of Britton and Billings have done for that of England and Scotland. Although possessing little of the magnificence of contemporary structures in France and England, the remains of Mediæval architecture in Ireland are distinguished by a simplicity and truthfulness of design and construction, a skilful adaptation to the local materials, and by some marked differences of style from contemporary buildings in England, which make them deserving of close study. It is gratifying that so many of them have been recently placed under professional supervision by the Government, and it is to be hoped their preservation from further ruin and decay will be the first object. Restoration it is almost dangerous to speak of, ending so often as it has done in total confusion and obliteration.

The next or third period of Irish architectural history, comprising the reigns of Elizabeth and the Stuarts, deserves more attention than has yet been bestowed on it. In this country, as well as in England, this period was distinguished not so much for the ecclesiastical as for the domestic buildings erected in it. The fewness and com-

parative poverty of the resident nobility and gentry of Ireland during that period, and the restless and disturbed condition of the country prevented the erection of any such extensive and sumptuous piles as Wollaton, Longleat, or Hatfield, and some attempts that were made in Ireland to rival those stately mansions seem to have been sadly interrupted; nevertheless there are some to be met with in different parts of the country highly interesting as architectural studies, and not the less so because they are often not altogether dissociated from the families to which they originally belonged. I may mention Leimaneigh Castle, in the County Clare, the ancient seat of the O'Briens; Donegal Castle, Ballyvourney Court, County Cork; and some others illustrated in Mr. Wilkinson's work, some of which would be well deserving of restoration and occupation, if but some of our local nobility and gentry could be induced to recognise the superior interest attaching to such a restoration, than to the erection of a brand new stuccoed pile, or mock feudal castle, which so many of them seem to think the acme of architectural excellence.

The fourth period into which I shall divide my subject (and it must be borne in mind that all such divisions are necessarily imperfect and conventional) is nearly coeval with the eighteenth century. This is doubtless a very important period in the political as well as architectural history of the country, and the one is intimately connected with the other. A well-known writer and participator in the transactions of the latter part of the century, the late Sir Jonah Barrington, characterises that century as having witnessed two events of no small importance, viz., "the Rise and Fall of the Irish Nation." There are some of us who presume to think that the historian should have carried his researches a little further back as to the rise, and left the history of the fall to be written by posterity. However that may be, it is unquestionable that most of our really great and noble buildings were erected not only during that century, but during the precise period of it which Sir Jonah selects for his history. The growing powers and importance of the Irish Parliament, culminating in the Declaration of the Volunteers in 1782, and ending in the Act of Union in 1800, had a most important influence on the architecture of the time. During that time, the more settled and prosperous condition of the country enabled the nobility and gentry to erect more stately and sumptuous mansions on their estates than had ever existed before. The holding of Parliament in Dublin required their attendance there for a great part of the year, and hence led to the erection of lines of stately town residences that still impart so much of dignity to our capital city. The Parliament House itself, great part of the Castle, the Law Courts, Custom House, and other important public and national edifices, bear witness that, whatever may have been the misdoings of the old Irish Parliament, it was not deficient in architectural taste, and displayed an honourable ambition that the public edifices of Dublin should not suffer by comparison with those of any other European capital. The late Lord Macaulay, while asserting in one of his essays that "there never was a more corrupt and tyrannical Parliament than that which sat in College-green," is obliged to admit in one of his letters that "the public buildings of Dublin (the work of the same Parliament) would be thought magnificent even in Paris." Whatever good it may have accomplished, the Union certainly inflicted a terrible blow on the development of architectural taste in Ireland, by at once sending the cream of our nobility and gentry to spend their winters in London instead of in Dublin; but it will be my pleasing duty to acknowledge shortly that the blow, however terrible, was not fatal, and that in the last period into which I shall divide my subject, namely, that since the Union, no small amount of progress in architecture and the kindred arts has been witnessed.

The eighteenth century formed an important epoch in the architectural history of England as well as of Ireland. The Renaissance or revival of classical architecture can scarcely be said to have been complete in the preceding century there; but in this it was fully accomplished, and it is remarkable that during the whole of the century we see or hear nothing of any style being practised but one. The early part of the seventeenth century was distinguished by a large admixture of Gothic elements with Classic; the portion of the nineteenth which has elapsed has seen the adoption of nearly every style that has ever

\* By Mr. W. Fogarty, president. Read at the meeting of the Architectural Association of Ireland, December 7.



appeared; but during the nineteenth century, in Great Britain and Ireland at any rate, but one style prevailed, which we may call Anglo-Classic or Hiberno-Classic, according to locality. It was certainly a great advantage to the architects of that time that they had not to fritter their energies on an endeavour to master the principles and details of several styles, but, having thoroughly acquired those of one, could devote themselves to pushing it to the utmost point of excellence of which it was capable.

At two periods in the present century it became the fashion to decry without mercy everything that belonged to the style just referred to. One was early in the century, when the discoveries of Stuart and Revett led to the introduction of Greek forms and details; and the other somewhat later, when the works of Rickman, Pugin, and others led to the Gothic revival. All that was not Greek in the first case or Gothic in the second was looked on as beneath contempt. The beauty of it was that the Gothic revivalists had no mercy on the Greeks any more than on the sober Anglo-Classicists before them; and, after many years of bitter controversy, it was suddenly discovered that there was great merit in certain buildings of the early part of the eighteenth century, and, under the name of the "Queen Anne style," the style of that century seems likely again to become the fashion.

Independently of these vagaries of fashion, it must be allowed that the most substantial, splendid, and conspicuous monuments of architecture in Ireland are those of the eighteenth century. It was generally admitted that the public buildings of Dublin at the close of that century (as they appear in the drawings of Malton) were rather beyond than behind what might be expected for such a city. The Castle then assumed its present form, with the exception of the chapel (added in the next century); the western front, chapel, hall, and library of the University were erected; the Houses of Parliament, Custom-house, Law Courts, and Exchange all erected; though at the Union considerable alterations were made in the Parliament House to adapt it to the present purposes of a bank. Albeit, the work of several successive architects, it is a building of which Ireland may well be proud. Classical in detail, and symmetrical in arrangement, it is yet original in composition, and produces an effect peculiar to itself, and different from any other Classical building I know of. We never see St. Paul's without being reminded of St. Peter's; the Capitol at Washington reminds us of both; nor can we see the Madeleine without thinking of the Parthenon; but the Bank of Ireland is unique. I never can cross College-green without a good look at it. The Custom-house stands as a splendid memorial to the genius of James Gandon, whose life by Mulvany is well worthy the perusal of all architectural students. The Four Courts, originally planned by Thomas Cooley, were completed by him. Until the completion of the new buildings now in progress, London will have no such law courts; and the distinguished architect engaged on these latter, however ultra-Gothic in his tastes, was glad to borrow a few suggestions from the Dublin ones, although now about one hundred years old. The Royal Exchange (now the City Hall), also the work of Cooley, has been thought worthy of reproduction by our American cousins in Philadelphia.\*

#### CORPORATION MARKET AT KNOTT MILL, MANCHESTER.

THE design for the new covered market which the Corporation of Manchester propose to erect at Knott Mill has just been selected by the markets committee, and will be submitted to the city council for consideration. About three months ago, the corporation invited Messrs. Magnall & Littlewoods, Messrs. Barker & Ellis, and Messrs. Corson & Aitken, architects, of this city, to compete for the best design for the market. Plans were prepared and submitted to Messrs. Mills & Murgatroyd, architects, also of Manchester, who were asked to report to the markets committee upon their respective merits. Messrs. Mills & Murgatroyd have selected the design of Messrs. Magnall & Littlewoods as being the most suitable in every respect.

The land proposed to be covered by the Corporation to form the new market is divided into two plots, separated by St. Matthew's Church. That bounded on the west by Fowler

Byrom-street is the larger, and contains in the aggregate 4,400 square yards; the other, nearer Deansgate, contains 2,757 square yards of nett land. The construction of the market, as proposed by Messrs. Magnall & Littlewoods, will consist of cast-iron columns and pilasters, and the supports at each angle of the market, and on each side of the main avenues and entrances, will be square cast-iron panelled pilasters, which will give solidity to its general appearance. Internally the columns will be round, so as to offer as little obstruction as possible. In laying out the land the ground has been kept as clear as possible of obstruction by the formation in the centre of each plot of a main avenue 50 ft. in width. The height of the roof to the main avenues will be 35 ft. from the ground to the louvered part, which is to rise 3 ft. 6 in. higher, and is to be filled in with louvres for ventilation. The roof to this portion is to be elliptical in outline, constructed with wrought-iron principals, tied with wrought-iron rods, which will be at the height of 29 ft. from the ground in the centre. An alternative proposal which Messrs. Magnall & Littlewoods have made is, that a wrought-iron lattice construction, principally of elliptical form, of 50 ft. span, should be erected over the main avenues. This roof would not require rods, but would involve an additional cost of about 1,000l. The cost of the market complete, including columns and foundations thereto, for covering the whole of the land, would be 18,000l.

#### NEW FLOUR MILLS, SUDBURY.

THE opening of the large flour-mills erected by Mr. J. F. Wiseman, of the Borley Flour Mills, on a part of the site of the Chilton Brickworks, on the Cornard-road, a few hundred yards from the town of Sudbury, was celebrated by a public dinner. The portion which has just been opened is, however, only the first part of a large and important undertaking. The remainder is being proceeded with, and will probably be completed next spring. The building which has just been opened is 45 ft. in length, 28 ft. wide, and about 65 ft. high, and consists of four stories above the ground-floor. The walls are built of white brick. The foundation is 6 ft. wide, and up to the first story the walls are 2 ft. thick; the walls of the next two stories are 21 in. thick; those of the next story 18 in., and above that to the gable 14 in. On the ground-floor are six pairs of 4-ft. stones driven by spur gear, with an upright shaft connecting all the machinery above, and also meal and endless conveyors and elevators. In addition to the six pairs of stones are two pairs of 4-ft. stones on pedestals, and driven by a strap from the upright shaft. The stage or upper floor contains the sack tackle, bran-dusting machine, by Huntley, Holcomb, & Co., and offal-separator, also two sets of mill elevators.

The engine-room is situated at the back of the main building, and in this is a pair of compound engines, by Beal, of Greenwich, and of thirty horse-power nominal. The boilers were supplied by Messrs. Ware & Co., of London, and the whole of the machinery was fixed by Messrs. Barton & Stearn, engineers, Sudbury, and Mr. H. Brewer, of Long Melford.

The mill is constructed in three parts, so that in case of fire one part might be destroyed and the others left intact. The shaft, which is a few yards from the boiler-house, is 82 ft. high, and the opening at the top is 2 ft. 2 in. in diameter. Adjoining the mill at the east end is an open brick reservoir, 30 ft. deep and 10 ft. in diameter, at the other end are the counting-houses.

The builder of the mill was Mr. Wanford.

#### THE NATIONAL GALLERY.

SIR,—I am induced, through reading a letter in your last number, to write to you upon the subject of the ventilation of the new portion of the National Gallery. It would be presumptuous on my part to say the arrangements for that purpose are not all they should be; in fact, they have not been carried out properly yet. What I wish to call your attention to is that, as far as I can ascertain (having no access to the roof) the whole of the appliances in the east, north-east, and north rooms (now respectively numbered 12, 13, and 14) are all closed, consequently the foul air cannot escape from above nor can the fresh air enter from below. Where so many valuable pictures are placed, and where hundreds, and occasionally thousands, of visitors assemble, the ventilation is of great importance,

A VISITOR.

#### "STRAITS OF BROMPTON."

MARLBOROUGH ROAD.

At a meeting of the Chelsea Vestry, on the 5th, Mr. Lawrence said he wished to say a word relative to the corner of Marlborough-road. An article had appeared in the *Builder* of last week, and also one on August 12th last, relative to the matter. It was really a very great question, and if the scheme could be carried out it would be attended with great advantages. It was suggested that the Marlborough-road should be widened at the Fulham-road end. One of the houses, a draper's shop, happened to be in Kensington parish, but all the others were in Chelsea. It was a matter which was certainly beset with difficulties, and it had been before the Board and the Improvement Fund Committee several times, but nothing had been done. There was a suggestion in that week's *Builder* that the parishes of Chelsea and Kensington ought to combine, and endeavour to effect the improvement, thus making a direct thoroughfare from Chelsea to Kensington. He moved the reference of the subject to the Improvement Fund Committee.

Mr. Compton seconded the motion, and hoped that the Metropolitan Board would be communicated with on the subject, as the improvement, if carried out, would be almost of a metropolitan character. The motion was carried.

The unanimity displayed leads us to hope that the effort will be made with a will, and so have a chance of success.

#### A NEW BRIDGE AT GLOUCESTER GATE, REGENT'S PARK.

THE St. Pancras Vestry are about to construct a new bridge near Gloucester Gate, Regent's Park. At the meeting of the vestry last week, a report was presented by the General Purposes Committee, reporting that the First Commissioner of Works had at length agreed to give the Vestry the required extent of ground for the construction of a new bridge at Gloucester Gate, and recommending that the works should be proceeded with as early as possible.

Mr. Richards, in moving the adoption of the report, said that for twenty years the Vestry had been striving to get this new bridge constructed, and he congratulated them on having at last been successful. It would be of the greatest advantage to the parish, and they would now have a direct road between Park-street and Gloucester Gate.

The adoption of the report was unanimously carried.

In answer to a question, the Chief Surveyor said that the plans would be ready in about a month, and as soon as they were approved by the Metropolitan Board of Works tenders would be advertised for, and the works would be at once proceeded with.

#### A NEW ROMAN CATHOLIC COLLEGE AT CLAPHAM.

A NEW college for the ecclesiastical training of students for the Roman Catholic priesthood is about to be erected in Clapham-road. It is to be established under the auspices of the Rev. Dr. Danell, the Roman Catholic Bishop of Southwark, who has purchased a freehold plot of land, with a mansion thereon, in the Clapham-road, for the purpose. The purchase-money for the land and buildings which have been secured is stated to be upwards of 10,000l., and the erection of the new college will be immediately commenced. In carrying out the works it is intended to retain the existing mansion, which is to be utilised as far as possible for the purposes of the college. The plans which have been prepared include, in addition to alterations in the mansion, which is large and spacious, the building of a new wing in the first instance. These portions of the intended college are expected to be finished and occupied for educational purposes in the course of a few months, but the entire building will not be completed until about the close of next year.

**Architectural Union Company.**—At the general meeting of this company held on their premises, 9, Conduit-street, last week, a dividend of 6 per cent. was declared after carrying 10 per cent. of the net income to the improvement fund, and setting apart the usual sum for fine to City for renewal hereafter.

\* To be continued.



COST OF LONDON SCHOOL-BOARD'S SCHOOLS.

At a recent meeting of the Board the committee reported the cost of the following new schools and additions to schools. The statement shows in what cases the authority granted to the committee to sanction extras up to 10 per cent. on the contract amount has been exceeded:—

Accommodation.	Name of School.	Expenditure authorised by the Board.	Extras authorised by the Committee.	Cost per Child.
	<b>• NEW SCHOOLS.</b>	£.	£.	£. s. d.
502	Laystall-street, Gray's-inn-road .....	5,172	522	11 6 10
785	Creed-place, East Greenwich .....	9,040	507	12 3 3
832	Regent-street, Deptford .....	7,333	262	9 2 7
582	Sydenham-hill-road .....	6,228	47	10 15 8
753	Hindle-street, Shacklewell .....	7,283	324	10 2 0
596	Jessop-road, Brixton .....	6,108	351	10 16 8
607	Garratt-lane, Wandsworth .....	5,773	299	10 0 1
548	Lower Park-road, Peckham .....	5,605	778	11 12 11
1,105	Mantua-street, Battersea .....	8,989	1,457	9 9 0
878	Neckinger-road, Bermondsey .....	8,174	320	9 13 6
837	Manor-road, Bermondsey .....	8,646	133	10 9 9
841	Albion-street, Rotherhithe .....	8,322	454	10 8 8
841	Knapp-road, Bromley .....	7,483	532	9 10 7
546	Glengall-road, Cabbitt Town .....	6,332	50	11 13 9
	<b>ENLARGEMENTS.</b>			
168	Cook's-ground, Chelsea .....	1,590	31	9 2 11
619	Original School .....	5,576		
277	Victory-place, Waltham .....	2,450	635	10 0 7
1,036	Original School .....	10,084		
100	Aldenhurst-street, St. Pancras .....	1,124	28	7 14 3
1,016	Original School .....	7,451		
	<b>ADDITIONS AND IMPROVEMENTS.</b>			
	Marlborough-street, Blackfriars-road .....	555	148	...
	London-fields, Bethnal-green .....	1,476	78	...

MORE NEW BOARD SCHOOLS FOR LONDON.

THE election of the members of the London School Board having resulted in a large majority favourable to the policy of the old Board, who had given notice of their intention to purchase land for the erection of twenty-eight additional new Board schools, in different parts of the metropolis, it may now be taken for granted that the buildings of these additional schools will be carried out. The total quantity of land proposed to be purchased is 67,521 square yards, or between 14 and 15 acres in extent. The quantity of land to be purchased in the Chelsea division is 16,730 yards, or about 3½ acres, for the erection of six schools; in Finsbury, 2,137 yards, for two schools; in Hackney, 8,264 yards, or nearly 2 acres, for six schools; in Marylebone, 5,334 yards, for three schools; in the Tower Hamlets, 3,672 yards, for two schools; in Lambeth, 17,110 yards, for six schools; in Southwark, 5,135 yards, for four schools; and in Greenwich, 8,539 yards, for four schools.

BAD CONSTRUCTION OF THE NUNHEAD NEW RESERVOIR.

As is generally known the Southwark and Vauxhall Water Company have for some three or four years past been engaged in the construction of new works, to meet the requirements for the needed additional supply within their district, and an enormous outlay of capital has been incurred in constructing new reservoirs at Nunhead, and laying down several miles of new mains to connect the reservoirs with the company's intake. These works are now all but completed, and until within the last few weeks it was expected that the additional supply of water would be furnished to the neighbourhood of Nunhead, Peckham, and the surrounding districts by filling the new Nunhead reservoirs. An unforeseen circumstance has, however, prevented this, and it now seems quite uncertain as to how soon the additional supply contemplated by the construction of the new works can be furnished. It appears that the company have recently taken into their service a new engineer, and according to the half-yearly report of the company which has just been issued, this gentleman has made statements of a very serious character respecting both the construction of the Nunhead reservoir, its situation, and the nature of the ground upon which it is placed. According to the directors' report to their shareholders, he states that he is neither satisfied with its mode of construction, its position, nor the geological strata upon which it rests, and that it will require much consideration on his part before he can take upon himself

the responsibility of filling the reservoirs with water, and bringing them into active use. The precise defects of the reservoirs, whether in point of construction or otherwise, are not stated, but it is to be presumed that these will all be explained to the shareholders at the meeting. In the meantime the reservoirs remain empty.

NON-FULFILMENT OF CONTRACT.

At the last meeting of the Urban Authority of Portsmouth, the subjoined clause from the Roads and Works Committee's report was moved by Mr. Jepps and seconded by Mr. Cunningham:—

Your committee recommend the rescission of the resolutions passed by the Council on the 6th of October last, accepting the tenders of Mr. J. S. Gabriel, for granite and chippings, and Messrs. Lees & Co., for lamp-columns, in consequence of their failing to enter into the necessary agreements for carrying their respective contracts into effect, and they recommend the acceptance of the following tenders in their place:—

A. F. Manuelle, Seething-lane, London,—  
Broken granite, per ton ..... 11s. 8d.  
Granite chippings, per ton ..... 7s. 6d.  
Jukes, Coulson, & Co., Clement's-lane, London,—  
11, 12s. per column.

Mr. A. Nance, jun., said it appeared that directly the contractor found out his tender was the lowest he withdrew from it. Mr. Gabriel was by no means a small business man, and ought to be exposed for treating the Council in the way he had done. So far as competency was concerned, Mr. Gabriel was as able to carry out the contract as Mr. Manuelle.

Mr. Cunningham divided the blame between Mr. Gabriel and the Authority. When the contract was accepted it should have been signed before any order was given, instead of which, granite was sent for. It would not go through the proper gauge, being 2½ in. instead of 2 in., and when it was sent back by the borough engineer, Mr. Gabriel refused to forward the proper size under 1s. a ton more than the tender. There was no legal claim on Mr. Gabriel unless a stamped agreement, which would cost 10l., had been used. The clause was ultimately agreed to.

BREACH OF CONTRACT.

At Worship-street, Thomas Edwards, Thomas Rutter, and James Higgins, cabinetmakers, were summoned before Mr. Bushby by Messrs. Lawes, cabinetmakers, of 65, City-road, for breaches of contract. The cases were heard separately, but all arose out of the same matter. The evidence of Mr. J. W. Benn, a partner in the firm, showed that the defendants were in their service as cabinetmakers. A mahogany wardrobe was required to be made, and the defendant Edwards had the estimate and plan of the work handed to him. He agreed to make it according to the plan for 4l. 2s. 6d. It appeared, however, that on the plan being shown to other men in the shop it was voted a new kind of work, and they said it should not be done under 5l. 2s. 6d. The men and the defendants were members of the same Society, which ruled that the work should not be done at the agreed price. Edwards accordingly threw it up, although he had signed the usual

contract for the job. The work was then offered to Rutter, who signed for it, but the shopmen refused to allow it to be done, except at their price, and he also threw up his contract. After some time Higgins signed the contract, but he was also coerced into breaking it. The work, it was said, still remained undone. Under these circumstances, Messrs. Lawes & Co. took the present proceedings, and claimed 10s. damages from each defendant. Mr. Benn wished, however, to inform the Court that such a sum was merely nominal, and the proceedings had been taken to show the men that they could not be allowed to rule the shop.

Mr. Bushby ordered Edwards to pay 10s. and 2s. costs. Rutter said he should have gone on with the work if the men in the shop had not threatened to break his head and "be on to him."

Mr. Bushby said that in using threats the men had committed a very great offence, and if brought before him they would find that the law was strong enough to reach them. He would be happy to grant summonses, if applied for. If, however, men like the defendant consented to such "bullying," and had not spirit enough to resent it and act an independent part, then he supposed such systematic terrorism would go on.

Mr. Benn said that the Society upheld the men in the matter, and had boasted that they could pay all the damages.

Mr. Bushby ordered Rutter to pay the damages claimed, with costs, and also made a similar order in the case of Higgins. The money was paid for the three defendants almost immediately.

Alfred Horne, of 8, Axe-place, Hackney-road, also appeared to a summons taken out by Messrs. Lawes for breach of contract in somewhat similar circumstances, and was ordered to pay compensation to the amount of 6l.

BUILDERS' ACTIONS.

LACEY v. VILLIERS—VILLIERS v. LACEY.

THESE were cross actions, in the Queen's Bench Division, arising out of transactions between the parties in relation to the pulling down of the old and building of the new Canterbury-hall, Westminster-road.

Mr. Day shortly opened the case. The plaintiff, a builder, carrying on a large business in the City of London, entered into a contract with Mr. Villiers, proprietor of the Canterbury Hall, by which he was to take down the old well-known hall, and build and reconstruct the new Canterbury for an agreed sum of 9,000l., of which 7,500l. was to be paid in cash, and the balance, 1,500l., was to be represented by the old materials of the building: and disagreements having arisen between the parties, it was in reference to the 1,500l. for the old materials that the action was brought.

The Judge, Field, having looked into the particulars and seen that the case involved questions of complicated accounts, and exhibited masses of figures, suggested that the matters in dispute would be far more likely to be settled to the satisfaction of the parties by submitting them to a referee than by a jury, and advised counsel that in his opinion would be best course for plaintiff and defendant to take.

Counsel, having conferred with their respective clients and their solicitors, agreed to his lordship's suggestion; and the case, withdrawn from the jury, went off accordingly for settlement by a referee.

Litigants in such cases, knowing the course usually pursued, might save themselves expenses by agreeing to reference without first going into court.

COMPENSATION CASE.

BIRD v. THE LONDON SCHOOL BOARD.—A NEW SCHOOL AT MILE-END.

THIS was a compensation claim in the Sheriff's Court, before Mr. Under-Sheriff Burchell and a Special Jury, by Mr. Bird, of Portman House, Globe-road, Mile-end, for land belonging to him near his residence required for the erection of a new school.

The claimant had resided more than sixty years in Portman House, and he had considerable property in the neighbourhood. He had a garden and orchard, and the property would be depreciated by the erection of a school, which would be a "nuisance" to persons in the immediate neighbourhood. The land could be utilised in building, and would realise a considerable sum.

Several valuers were called, and the estimate was about 5,000l., and a question was raised as to the extent required by the School Board. No evidence was given on the part of the Board. It was proved that land in and near London was rising in value, and it was said that builders expected about "ten per cent." for their money. For the Board 1,718l. was named as the full amount of the claim that could be made for the property.

The Jury awarded 3,000l.

**Lichfield Cathedral.**—Soon after Archdeacon Bickersteth's appointment to the deanery, he expressed his great desire to advance the work of improvement of the cathedral another stage, and to commence the renovation of the exterior, more especially the west front, which, though originally one of the most beautiful façades in the kingdom, is now for the most part faced with Roman cement. This cement was applied to it about fifty years ago, and is now beginning to perish in several places. The restoration will be directed by the cathedral architect, Sir G. G. Scott, R.A., the Dean's object being to reproduce the whole in stone in accordance with the guiding details, which still remain in several places, more especially the north-western tower.



## GLASS ROOFS FOR LONDON.

SIR,—I notice in your issue of the 25th ult. a reference to the glass roof over my offices in Bunhill-row, by Mr. Knight, in a paper read at the Royal Institute of British architects.

As I have had many inquiries respecting this mode of construction, and it has now stood the test of time, having been erected when the offices were built in 1872, perhaps you would kindly allow me to take the present opportunity of stating my experience in the matter.

The roof proper is flat, of iron and concrete faced with cement, the underside of the roof forming the ceiling of the bedroom below; a parapet-wall is carried up about 3 ft. high all round, and on this wall a sill is laid; from this sill circular bars spring and meet on the centre, where there is a raised hopper for ventilation; sashes open at each end, but no ventilation is provided at the sides.

An inner wall, about 2 ft. 6 in. from the parapet wall and parallel with it, forms a tank running round the house with a clear floor-space in the centre. This tank is filled with mould and planted with vines.

It is not quite correct to describe this as the Paxton principle, as Mr. Knight has done. Paxton's Crystal Palace roof is on the ridge and valley principle, one curved iron rib being larger than the next, and straight wood bars reach from one to the other, forming a succession of ridges and valleys. This system would greatly reduce the space in the roof of a London house, and mine is a simple curved roof, very similar to my illustration in my weekly advertisement in the *Builder*. The bar being of wood, bent on a principle patented by me, where, by steaming the bar, bending it whilst hot on a saddle in three pieces, and screwing them together whilst there, the outer member of the bar acts as a truss on the inner member, and the tendency to spring back is almost entirely obviated; as an instance of the adaptability of wood thus bent to its purpose, I may mention that after being fixed now for four years not a single square of glass has been broken or even cracked through any movement of the bar. The glass, I may mention, is not bent, only common straight glass is used, and by having a deep rebate in the bar the curved line alone is seen giving so much the effect of bent glass that a close inspection is necessary to convince people the glass is not really bent.

I am thus particular in describing the construction of my roof as I find an objection is raised on the score of expense and the cost of repairs. Its first cost would be about 2s. 6d. per foot superficial for the wood and glass, and the cost of repairs would be perhaps a coat of paint every two or three years.

And now as to what can be grown. I have said I have planted vines. These are doing very well. I have already gathered one or two bunches of grapes, and I hope ultimately to produce as good a crop as can be produced in an unheated vinery of the same size, although I am only seven minutes' walk from the Bank of England.

I say unheated, but, of course, it could be heated very easily, being on the top of the house. A boiler in connexion with any fire-place in the house might be connected with it.

The advantages of such a mode of construction, if generally adopted, would be a very great improvement in the roofs of our houses. As glass is to slates and tiles, so would these improved roofs be to existing ones in those dull November days. The room on the roof would be the brightest room in the house. With the streets of London getting more crowded daily, the children of the care-takers, who must live as best they can in town, would have a playground cheerful and safe, and after the labours of the day are over, the room on the roof, with its vines overhead and its peeping bulbs below, is a pleasant beneficial change that any one having once enjoyed would not readily part with.

I am quite sure if these roofs were better known, they would become more general, and I shall be very pleased to answer any questions that may be addressed to me on the matter.

W. H. LASCELLES.

## SALT IN STONE.

1. Would sandstone, quarried in a sea cliff, about 7 ft. below high-water level, be so saturated with salt as to be unfit for using in building a dwelling-house, the mortar being made with fresh water sand, and the walls battened?  
2. Would it be practically possible to put such stone through a process which would get rid of the salt; and if so, what is that process?  
L.

## A CHURCH IN THE FOREST.

A CHURCH dedicated to St. Andrew has been opened in the Forest of Melksham, in the county of Wiltshire,—a wild and uncultivated district. This church in the forest is not only erected in the sylvan retreat of "Woodpecker tapping at the hollow beech-tree," and the lair of foxes, but must look for a congregation from a very scattered district.

To the liberality of the Rev. E. L. Barnwell this little forest church and its primitive woodcutters are indebted, at a cost of 3,700l. The site was given by Mr. T. J. Heathcote, and other friends have helped to embellish the edifice. The architect is Mr. Charles A. Dye, of Bradford-on-Avon, who also designed the super-altar.

The edifice—70 ft. by 20 ft.—is capable of seating 180 persons, which, with but a few seats for the aged, &c., are all unreserved. St. Andrew's in the Forest is built in the thirteenth-century style, and of freestone. It consists of nave, chancel, and vestry, the chancel arch springing from foliated corbels. The stained-glass windows, by Mr. Powell, of Whitefriars, are grand for so small a church. The communion-table, of oak, is a fac-simile of that in the church of Bois Sainte Marie, Soane-et-Loire, France, of the eleventh century. The font is a copy of the thirteenth century one of Lymshall, Herefordshire. Why?

## SANATORIUM, BANTRY BAY.

In a recent brief article of the *Builder* respecting the beautiful retreat of Glengarriff, as compared with other watering-places, it was omitted to state that, in addition to its wide range of incomparable scenic beauties, the degree of temperature during winter and spring is 3½° higher than Montpellier, although situated more northward by 9°; besides that, as a place of summer resort, it is milder and more equable; for here there is no sunstroke, no malaria, no mistrale, no bise: in fact, the native vegetation proves the mildness of climate, as we find the arbutus and other flowering shrubs in richest luxuriance, decorating its wild and varied vales, hill-sides, and scarped rocky passes.

Open to a bay of over twenty miles in extent, having a width varying from four to seven miles, bordered by picturesque and craggy coasts—Bear Island at the entrance of its wide, deep waters; Garinish Isle and Tower midway; and then Glengarriff Bay, with several Romanesque islets, of which the sanatorium and hotel command the richest views, this site is unequalled by any other resort for invalids, being certainly more temperate during summer than Nice, or any of the Mediterranean seaports, which cannot be tolerated by tourists for residence after April.

It is stated in Prince Packler-Muskan's Tour so far back as 1828:—"The climate is the most favourable possible for vegetation; that all sorts of evergreens, azaleas, rhododendrons, and even camellias, stand abroad during winter; and that dates, pomegranates, magnolias, lyriodendrons, attain their fullest beauty."

All medical men of note in Ireland now recommend their patients in consumption, laryngeal or bronchial diseases, to visit Glengarriff Sanatorium; and Dr. Gilbert Smith, of Harley-street, in 1875 wrote that in his own individual case he had derived great benefit from a two months' happy sojourn at the Eccles Hotel there.

Dr. Hudson, ex-president of Queen's College, Dublin, states:—"I first became acquainted with the place when suffering from a laryngeal cough, which, however, rapidly yielded to the influence of its mild climate. Since then I have induced many invalids to resort to it, with decided advantage in every instance. Glengarriff appears to me to be suited to those who require a mild climate, with shelter from prevailing winds."

The climate of this part of Ireland is attested by the class of plants which grow luxuriantly in the open air; and the meteorological table of the district proves that the average temperature exceeds London by 7°; Torquay, 6°; Cove, 4½°; Undercliff, 5°; and Penzance, 4°; the difference being still greater in the spring months. As a summer resort, the numerous drives through magnificent scenery confer a greater value upon Glengarriff, which, although there is yet no railway nearer than twenty miles, may be reached from London within eighteen hours,—the grand drive to Killarney lakes (via Kenmare); the

pass of Kemeagh, and Gougane Borra; the harbour of Bearhaven; the celebrated caves in Bantry Bay; the Sugar-loaf Mountain; Hungry Hill and waterfall; Adrigole harbour; the Priest's Leap; the Cloonie and Inchiquin lakes; Glanmore Lake and Cobduff Mountain: such a continuation of enchanting views is not to be found in any other country. Thus lofty mountains (from 2,000 to 3,000 ft.), with interesting hills, crags, and ravines, protect the north, north-west, and north-east of the Sanatorium, which is provided with 40 acres of grounds, having extensive walks and plantations; so that complete shelter from wintry winds is secured by nature, which also attempers the sea by the influx of the warm Gulf Stream tiding in at this south-west extremity of Ireland, from the Gulf of Mexico to Bantry Bay.

The existence of such a *refugium patientorum* has been but lately appreciated in Ireland, and being wholly unknown in England, these few particulars are given by T. H. H.

## RISK AT THAMES DITTON.

SIR,—Perhaps there is no church in Surrey that claims the attention of archaeologists more than that of Thames Ditton, having, for one thing, escaped damage in Cromwell's time; for here we find brasses, 1534, seven or eight about this date, some Norman-French on one of the pillars, and an old lance-shaped window, also a peculiar arch, a Norman font found buried in the church, and, as Murray says, a remarkable monument to the Seargeant Confectioner of Henry VIII., and various other interesting relics. Notwithstanding all this, it is doomed to destruction either by churchwardens or some other Solon. There are three gaslights, with three jets each, placed from the wall within a foot of the ceiling,—if to burn the ugly gallery down alone, so much the better, but to destroy this ancient church would be as atrocious as burning Canterbury Cathedral. T. BROWNE.

## UNHEALTHY BUILDING, AT BATTERSEA.

THE evils of cheap building by those needy and speculating builders who run up houses merely to sell, had an illustration last week at the meeting of the Wandsworth Board of Works. A letter was read from the Rev. John Toone, vicar of St. Peter's, Battersea, drawing the attention of the Board to the fact that in Palk-road, Battersea, houses were being built upon rubbish and dust-shoots, without basements, and with boarded floors close to the earth, and that in scarcely any of the houses was there any provision for ventilation beneath the floors. The letter elicited a discussion amongst the members of the Board, but with no practical result, the generally expressed opinion amongst them being, that in the present state of the law as to building within the metropolis they had no power to remedy the evils complained of. Mr. Cox, one of the members of the Board, suggested that the attention of the Metropolitan Board of Works be drawn to the manner in which modern houses were often built in the Battersea district, on which the chairman remarked that the Board were perfectly aware of the evils caused by the practices by builders complained of in the letter. They had endeavoured, at the cost of thousands of pounds, to remedy it, but their hands were tied. The Metropolitan Buildings Act seemed only to provide against fire.

**The Proposed Aquarium at Birmingham.**—The plans of this projected building have been printed and privately circulated. According to a Birmingham paper, they show the aquarium tanks skirting the ground-floor of the central hall, of which they form the outer walls. The tanks are twenty-one in number, the largest being 50 ft. long and spacious enough to contain most important and interesting specimens. The table-tanks will be numerous, and placed in a conservatory, which will serve as a vestibule to the corridors of the aquarium as well as to the central hall. The floor above the entrance to the building will be used as a tea-room, the windows of which will open on to the upper part of the conservatory. The tea-room will communicate with a gallery running round the central hall, intended for the exhibition of scientific models. The central hall, flanked by the aquarium tanks, will be used as a concert-room. The site proposed for the building is in New Edmund-street.



## A BIGGER "JACK" STILL.

A CORRESPONDENT, "W. B. S.," writes thus:—You have a notice of a great roasting-jack made for the Duke of Westminster's kitchen at Eaton Hall, in your paper of last week, and an account of one still greater—made for the "Teach Miodhchhuarta," or banqueting-hall, of ancient Tara—may perhaps interest your readers.

This gigantic spit, called "Bir Nechin," or the Spit of Nechin, the chief smith of Tara, appears to have been half the length of the hall, and so constructed as to shut, or be coiled up, when not in use. A very old Gaelic MS., preserved in Trinity College, Dublin, describes it as—"a stick at each end of it, and its axle was wood, and its wheel was wood, and its body was iron: and there were twice nine wheels on its axle that it might turn the faster: and there were thirty spits out of it, and thirty spindles, and thirty hooks, and it was as rapid as the rapidity of a stream in turning: and thrice nine spits and thrice nine cavities [pots], and one spit for roasting, and one wing used to set it in motion."

The household of the Monarch of Erin, that sat in the hall, numbered over a hundred, and the daily allowance for dinner was two cows, two salted hogs, and two pigs. A great double-handed vessel, called the "dabhac," or vat, held a hundred "drinkings," and the vat was furnished with fifty grooved golden horns, and a hundred pewter vessels.

Two plans of the great hall of Tara, with this great spit and its attendant "daul," or waiter, the "dabhac," and the different positions set apart for the company, taken from the "Book of Leinster" and the "Yellow Book of Lecaine," are given in the series of *fac-similes* of the National MSS. of Ireland, made at the Ordnance Survey Office in Southampton.

## THE SPA COMPETITION, SCARBOROUGH.

SIR,—Some few years back the Cliff Bridge Company advertised for plans for laying out the new grounds, and offered premiums of 100*l.* and 50*l.*, the premiums to merge in the commission on the cost of the successful architect's plan. Numerous competitors from all parts of England sent in designs under no. 60. I was fortunate enough to obtain the first premium of 100*l.*, but as yet no extensive works have been carried out. I have also since the competition, by order of the committee, prepared various plans for skating-rinks, baths, extension of the promenade, &c., none of which have been carried out. I think, therefore, I deserve some consideration at the hands of the shareholders, having, as I consider, fairly won the position I at present hold of "Architect to the Cliff Bridge Company," and as it is the invariable custom when there has been a competition for the successful competitor to be employed for the carrying out of any works of a similar character, I hope no exception will be made in my case,—otherwise why have competitions?—for no architect of any standing would compete, did his success lead to nothing beyond the premium. The 100*l.* I received scarcely paid for the cost of getting out the competition plans, and further I prepared plans and superintended the construction of a retaining wall to the new ground at an outlay of about 800*l.* at no charge to the company; the commission on the same being 40*l.*, it reduced the premium of 100*l.* to 60*l.*, actually leaving me considerably out of pocket.

I do not think many architects are aware that at a meeting of shareholders, on the 13th of November, my plans were produced and approved of generally by the committee. They did not bind themselves to them in detail, for they were only sketch plans; since then the committee have issued instructions to architects, and in these instructions I see in clauses Nos. 1 and 4 they actually suggest what was shown in my plans, and which embodies the general scheme, thus giving to the public the benefit of all my thought and work. Of the injustice to me in this matter I will make no comment.

C. A. BUSY.

## THE NEW BRIDGE OVER THE REGENT'S CANAL, CHALK FARM ROAD.

SIR,—At a meeting of the Highways and Public Works Committee, held on Monday last, a member drew the attention of the committee to a letter that appeared in the *Builder* of the 2nd of December, signed "Matt. T. Shaw & Co.," in which the following misstatements are made:—

"The novel feature of utilising the two main girders to serve as gas mains emanated from and has been carried out by us. We have constructed these girders so as to be quite gas-tight,"—and I am directed by the committee to request your permission to correct the misstatements.

The idea (which is not novel) of utilising the two main girders to serve as gas mains did not emanate from Matt. T. Shaw & Co. It emanated from Mr. Hersey, the well-known and much respected Chief Inspector of the Imperial Gas Light & Coke Company. I had made provision for carrying a gas main of the same size only as the main that was laid over the old bridge, not knowing that the requirements of the gas company rendered necessary much larger mains over the canal for the supply of the

district to the north of the canal. Mr. Hersey suggested the use of two of five main girders when he first became aware of their shape and size. The idea is not novel to Mr. Hersey. In 1871 the Imperial Gas Company constructed a bridge over Sir George Duckett's Canal—the "Three Colts Lane" Bridge—of which the three main wrought-iron girders are used as gas mains, the capacity of the three girder mains being equal to two 48-in. mains that are laid in Three Colts Lane (which leads from Old Ford-road to Victoria Park) on either side of the canal.

The other mis-statement I am directed to correct is this, "We have constructed these girders so as to be quite gas-tight." Unfortunately they are not so,—indeed, so little satisfactory is their condition as to gas-tightness, and the delay caused by the endeavours to make them so is creating so much dissatisfaction, that I have reason to believe the gas company contemplate the abandoning the idea of using the girders as gas-mains, unless they are rendered completely fit for that purpose within a very limited period.

WILLIAM BOOTH SCOTT, C.E.

Chief Surveyor to the Vestry.

St. Pancras.

## "THE INFLUENCE OF BUSINESS REQUIREMENTS UPON STREET ARCHITECTURE."

SIR,—As my paper on the above subject, read at the Institute on Nov. 20th, was published in *extenso* in your journal, you will do me a favour by publishing the accompanying letter from Messrs. Belcher, having reference to my criticism upon Mansion House buildings.

Their explanation affords but another instance of the injury to architecture, and injustice to its professors, likely to result when employers fail to entrust the entire structure, with all its finishings, to the one master-mind of its designer.

SAMUEL KNIGHT.

In your interesting paper read before the Royal Institute of British Architects on "Street Architecture," &c., we observed in your otherwise flattering allusion to our Mansion-house Buildings, at the corner of Queen Victoria-street, that you justly criticise its "substructure of shops." Such is the value of frontage for advertising purposes that, in spite of our urgent request, the ground-floor was taken out of our hands, that experienced shop-front fitters might contrive to cover every available inch of space with plate glass! Massive piers which we had built at the circular corner were afterwards cut away, amongst other things, for this purpose. Thus we are in no way responsible as architects for this ground-floor, except the entrance to offices, which we with some difficulty maintained.

We believe that a re-action is now setting in, and healthy criticism will aid it. The shop-keeper is learning the fact that he can attract the attention of the public other than by his goods and wares, and that a well-designed ground-floor in connexion with the upper structure gives a character to his business and distinguishes his shop from his neighbour's, and that with reasonable-sized openings or sub-divisions goods can be better classified and displayed.

J. &amp; J. BELCHER.

## CHURCH-BUILDING NEWS.

**Hambledon (Hampshire).**—The Bishop of Winchester has re-opened a fine village church, that of Hambledon in Hampshire. This church has double nave divided by a transverse arch, forming the entrance arch of a smaller church built in pre-Norman times. That edifice appears to have been enlarged by the addition of a northern aisle, whose massive pillars resemble those of St. Cross, near Winchester. Subsequently, a southern aisle was erected; and then, in the thirteenth century, an extension eastward was made by the erection of a second nave with aisles and a spacious chancel. This church retains the ancient feature of a gradual slope of the floor upwards, from west to east. The chancel was restored by the Ecclesiastical Commissioners under their architect, Mr. E. Christian; and the rest of the church at the expense of the parishioners from the plans of Mr. James Foster, of Southampton.

**Shirburn.**—The parish church of Shirburn has recently been re-opened, after restoration at the entire cost of the Earl of Macclesfield. The church, as it now stands, mainly consists of fourteenth-century work, but traces of a much older church have been found during the progress of the works. It consists of nave, chancel, north and south transepts, and north chapel, the latter being used as a burial-place for the Parker family. The church has been, with the exception of north transept and north chapel, entirely re-roofed, open roofs of stained deal, plastered between rafters, being substituted for the plaster ceilings

and leaky roofs of old. The chancel roof is boarded with moulded ribs. A new south porch has also been built, and a stair turret added to the tower. The whole of the roofs are covered with Broseley tiles, of a warm brown tint. The floors of the nave and transepts are laid with Staffordshire quarries, arranged in various patterns. The floors of the chancel and sacristy, and the mosaics of the reredos, were supplied by Messrs. Simpson & Co. The east window and west tower window have been filled with stained glass by Messrs. Ward & Hughes, of London; the subjects being—in the east window, "The Adoration of the Magi," and in the tower window, "Christ blessing little Children," the tower being used as a baptistery. The painted glass has been given by the Countess of Macclesfield. Some interesting discoveries were made during the progress of the work. In the south transept a fine Decorated window, concealed, on the inside, by a large monument, and, on the outside, by brick and plaster, has been opened and restored. The whole of the works were executed by Messrs. Symm & Co., of Oxford, under the direction of Mr. T. H. Wyatt, architect, of London, Mr. J. Stockham, Estate Clerk of Works, superintending.

**Seend.**—The chancel of Seend parish church, near Bath, has just been re-opened, after rebuilding. Seend Church is a Perpendicular erection, the nave and north aisle having been rebuilt in the fifteenth century, while the lower part of the old church appears to belong to a still older fabric. The chancel being considered very inadequate and unsuitable, the Vicar resolved, if possible, to rebuild it, and consulted Mr. A. J. Style, architect, of Thames Ditton, from whose designs the chancel has been rebuilt. In preparing his designs, the architect kept in view what he believed would have been the intentions of those who restored the church in the fifteenth century, had they been enabled to effect the entire rebuilding. Bath stone has been used in the construction of the building, the roof, which is covered with lead, being partly of oak and partly of pitch pine. The stalls are of oak. The total cost of the restoration has been about 1,000*l.* The contractor was Mr. R. D. Mullings, of Devizes.

**Buckie.**—All Saints' Episcopal Church, Buckie, has just been opened. The new church stands on the Square, or ground given by Mr. Gordon, of Cluny, the proprietor of Buckie, and may be described as of the Decorated Gothic style. Internally it measures 73 ft. by 21 ft. 6 in. It consists of a nave and chancel, the latter having a circular end. The chancel is separated from the nave by a stone arch, and is elevated by a series of steps, three at the arch, and two at the sacristy. There will be accommodation for 180 persons. The entrance-door is at the south-west angle of the nave. A porch has been erected here, and above it is a tower and broached stone spire, rising to the height of about 100 ft. Mr. Ross, Inverness, was architect of the building, and the contractors for the whole of the work were Messrs. Stuart & Taylor, Peterhead. The gasfittings were supplied by Messrs. Cox & Son, London. The total cost was 2,000*l.*

**The Ruins of Persepolis.**—In a second lecture delivered to the members of the Midland Institute at Birmingham, on the 4th inst., Mr. Arthur Arnold said that two distinguished Englishmen who had written upon the ruins of the halls of Darius and Xerxes at Persepolis—Professor Rawlinson and Mr. Fergusson—had never seen them. Had Professor Rawlinson seen the buildings of Italy, of Greece, of Egypt, and of Asia, he never would have written of the ruins of Persepolis, and in particular of the Hall of a Hundred Columns, as the great pillared halls which constitute the glory of Arian architecture, and which even in their ruins provoke the wonder and admiration of modern Europeans, familiar with all the triumphs of Western art, with Grecian temples, Roman baths and amphitheatres, Moorish palaces, Turkish mosques, and Christian cathedrals. This is just the point in which the buildings of Persepolis fail. They are deeply interesting as records of the Achaemenian dynasty; they are illustrated books of priceless value in their inscriptions and sculpture; but for grandeur, and even solidity, they never were comparable to some of the buildings of Athens, nor among modern and Christian buildings to the church of St. Isaac in St. Petersburg.



## STAINED GLASS.

**Charlton.**—The east window of All Saints' Church, Charlton, Wilts, has been filled with stained glass, the subject being the Crucifixion. The window is by Hardman & Co., of Birmingham, and was the gift of Earl Nelson.

**Clive.**—The little church in the village of Clive, near Grinsbill, has just had all its windows renewed. The window over the reredos has been erected by Miss Catharine Harding, of The Clive. The subject of the design is the Ascension of our Lord. The memorial window and the other new windows are the workmanship of Mr. John Davies, of Shrewsbury.

**Nottingham.**—The new west window in St. Mary's Church, Nottingham, was dedicated on the 16th ult. The window is the work of Messrs. Hardman, and is stated to have cost 1,400l. The subject of the whole is the life of St. Mary. This window is in memory of the late Thomas Adams.

**Dover.**—A stained-glass window has just been added to Trinity Church, Dover. The centre light has been given by the Misses Pain, in memory of their late father, Mr. Thomas Pain, and another light by the family of the late Mr. John Hayward, as a memorial of their parents. The window altogether consists of five lights. Above these is a circular light. The work, which covers upwards of 200 square feet of glass, has been designed and executed by Messrs. Lavers, Barraud, & Westlake.

**Buckland.**—It has been determined to accept the design and specification of Messrs. Clayton & Bell for a stained-glass window for the north side of the chancel of Buckland Church, as a memorial of the late Rev. Joseph Moore, rural dean and vicar of Buckland.

## Books Received.

*The Economy of Workshop Manipulation.* By J. RICHARDS. London and New York: E. & F. N. Spon. 1876.

Books on construction generally consist of examples, drawings, and explanations of things constructed, but in most cases the learner can examine the things themselves. Examples and drawings relate to *how* things are constructed, but a better inquiry for a learner is *why* they are so constructed.

In studying a steam-engine, for instance, steam, as the motive agent, should first be studied, and an apprentice must first learn to regard force as an indestructible element,—something that may be measured and transmitted, but not created or destroyed, by mechanism; then the nature of the mechanism may be understood. But a learner should study the nature of the force which acts upon an engine through the example of, and as acting upon, that engine, and not abstractedly. Take, for instance, the case cited by the author, "the sum of the squares of the base and perpendicular of a right-angled triangle," being equal to the square of the hypotenuse. "How dull and objectless it seems to a young man," without knowing a purpose to which the problem is to be applied. But if the same learner were to see the foreman of a building squaring a foundation by measuring out six on one side and eight on the other, and ten across from point to point, he might see in this operation the application of that tiresome problem, and would awake to a new interest in the matter. And so, in studying the force of steam or of water, if he regard it as applied to an actual engine he will study it with more effect.

In designing the parts of an engine, or anything to which motion is to be given, regard must be had to experience in the velocity of the motion in actual machines. The author's remarks are mostly of a general character on machinery; but in the matter of shafts he says that experience has demonstrated that, for ordinary cases, where power is transmitted and applied with tolerable regularity, a shaft 3 in. in diameter, making 150 revolutions a minute, its bearings three to four diameters in length, and placed 10 ft. apart, will safely transmit 50-horse power. The strength of shafts to resist torsional strain varies as the cube of the diameter, and by assuming the above-described example to be true,—and it can be proved in numerous examples in practice whether it is true or not,—the diameter of a shaft to transmit greater or less power can be ascertained. The length between the bearings should be as the diameter, and the

speed inversely as the diameter. The transmission of power by means of belts, by gearing, by water, and by air, is commented upon by the author; and in respect of the use of air he gives a few useful directions for consideration:—1. The value of pneumatic machinery in reaching places where steam-furnaces cannot be employed. 2. The use that may be made of air after it has been applied as a motive agent. 3. The saving from condensation, to which steam is exposed, avoidance of heat, and the consequent expansion and contraction of long conducting pipes. 4. The loss of power by friction and angles in conducting air through pipes. 5. The lubrication of surfaces working under air-pressure, such as the pistons and valves of engines. 6. The diminished cost of generating power on a large scale compared with a number of separate steam-engines distributed over manufacturing districts. 7. The effect of pneumatic machinery in reducing insurance rates and danger of fire. 8. The expense of the appliances of distribution and their maintenance. We commend these remarks to the attention of our readers.

Throughout the book are dispersed hints and remarks useful alike to the apprentice, the workman, and the master.

## VARIORUM.

UNDER the title of "Rough Sketches from the Hebrides," Miss Florence Selous is contributing to "Chambers's Journal" some graphic papers on this little known district. We quote a few sentences from her "Glimpses of Skye":—"Before quitting the Highlands, I must say just a few words about the people who live and die in these beautiful regions of mountain and valley, lake and sea. The rain, and the mist, and the sharp mountain air seem favorable for the development of muscle and bone, for these men and women are a fine, stalwart, healthy race; in many places, especially among the sailor and fisher classes, they are a handsome race as well, with fair hair and skins, fine features, and keen eyes. In and about Stornoway, many of the women are beautiful, and their beauty is set off to great advantage by a very picturesque costume. But everywhere, whether handsome or not, we have found them characterised by a peculiar gentleness and courtesy of manner, by a natural refinement, that removes them utterly from the very slightest tinge of vulgarity and commonness, and by an intelligence and cultivation which are rarely met with among the lower classes in the south. Not only do they nearly all read and write, even those who dwell in miserable mud hovels, but many of them read books, and think, and deliver themselves in well-chosen and intelligible, if quaint English, on various subjects of public and individual, or even political, interest, upholding their own opinion warmly and well when they happen to differ from you. Many of them feel and speak strongly on the subject of the system of large landholdings that prevails throughout the Highlands to the exclusion of peasant proprietors, and also of the severity of the game-laws, and the harshness of the punishments attendant on the breaking of those laws. In their speech they are singularly refined; and the very poorest, even when quarrelling, rarely make use of the vulgar, meaningless, and brutal words and oaths that disgrace and disfigure the speech of the poor in England either in town or country. As for real kindness, ready sympathy, and willing help in any emergency, I think these Highlanders cannot easily be surpassed."—*Cassell's Family Magazine* suggests comfort for cold journeys:—"During a far and tedious journey, the want of some method of warming railway carriages is a bitter experience to most travellers. Foot-warmers are not enough, and even these are not always available, or even procurable. People have, therefore, to remain in half-frozen wretchedness, and it is, perhaps, not too much to say, that railway discomforts kill more people than railway accidents. A French inventor, however, has contrived a combustible compound which may help to introduce a golden age for travellers. 'It is,' he says, 'susceptible of numerous applications, but it is specially designed for warming vehicles employed for the transport of passengers on railways and common roads.' The base of this new fuel is carbonised tan or wood-bark, which is mixed with a small quantity of nitrate of lead, or spirit of nitre; slaked lime or loam being added as agglutinative or agglomerative matter. The composition burns very gradually, and the combustion may be rendered still slower by adding to the above

materials a small quantity of the dust of wood-charcoal. Neither smell nor smoke is given off, and the new compound not only ignites with the greatest facility, but once ignited burns continuously and uniformly. A small quantity burned in a foot-warmer or chafing-dish, with a limited supply of air, will not be completely consumed for about sixteen hours, and during that time will develop heat enough to warm a compartment of an ordinary railway carriage."—Messrs. T. Pettitt & Co. have issued a new pocket diary ruled for quantities, specially for the use of architects, surveyors, and builders.—"Mr. Punch's Pocket Book" retains its usual character. The frontispiece illustrates amusingly "the Autumn (Matrimonial) Madcayres." Mr. Tenniel's "Modern Munchausen" is excellent.—"We understand that of Captain Burnaby's "Ride to Khiva" not less than 1,000 copies, in addition to the large number required by the other libraries, have been taken by Mr. Mudie alone; that the first and second editions of the work were exhausted in a week; and that a third edition is already nearly exhausted. A fourth edition is in the press.

## Miscellaneous.

**Art Teaching.**—Mr. W. H. Fisk, of University College, delivered an address on Monday on this subject before the Society of Lady Artists, in their gallery, Great Marlborough-street. Mr. Fisk said that in the course of an experience of over thirty years in teaching he had learned the requirements and the difficulties of students. In the first place, art was a craft, and to produce good work certain rules must be followed. In a painting school, the subjects necessary for a pupil to study were form, methods of painting, composition, effect, colour, perspective, and the aspects of nature. As to whether the study of form should be pursued from the life first or from the antique, the antique, he said, should be used for improving the taste, but the pupil must be educated to understand where the beauty of the antique lay. With respect to methods of painting, the various methods used by the old masters should all be taught to the student, when he would discover some method through which he would feel that he could express himself with the brush. The rules of composition, colour, and effect should also be learned, for this reason,—that if a student had no feeling for any one of these, the knowledge of the rules would prevent his making blunders. The great evil of the present art-teaching was that the teachers staked everything upon the chance of the pupil having a feeling of art; and the rules which he urged as of importance after his long experience were lost sight of. A pupil could only learn his craft through the medium of analysis, and therefore the study first of all should be analytic. He considered it disgraceful that in this country there was no school for the students of landscape-painting.

**Improvements in Prince's-street, Edinburgh.**—Although, so far as the reconstruction of the Prince's-street carriage-way is concerned, arrangements with the Tramway Company and the Road Trust have not yet been completed, the City authorities, with a view to push on the work connected with the improvement of that important thoroughfare, have invited estimates for the widening of the north foot pavement and the erection of new parapets and railings alongside of the gardens. The probable cost of the work, for the portion of the street between Hanover-street and Hope-street,—being the section included in the agreement between the corporation and the West Prince's-street proprietors,—is stated at 12,160l., 2,341l. going for the railing, copestone, &c., 7,412l. for the carriage-way, and 2,404l. for the foot-pavements. On the portion of the thoroughfare between Hanover-street and South St. Andrew-street, the expenditure is expected to be 6,094l.,—781l. for railing, 4,878l. for the carriage-way, and 925l. for the foot-pavements. The remaining part of the street has not been included in the estimate of the cost.

**Bristol Free Libraries.**—The active chief librarian, Mr. J. F. Nicholls, has just now issued an Index Catalogue of the volumes in the Central Library, King-street, Bristol,—including both the Lending and the Reading Department. The collection in the various Public Free Libraries there has become a very large and good one.



**A Well-Earned Compliment.**—Last year, when Mr. B. T. Brandreth Gibbs was for the thirty-third year elected the honorary secretary of the Smithfield Club, the Prince of Wales then being president of the Club, and occupying the chair, a special vote of thanks was given to that gentleman. This vote of thanks was duly engrossed on vellum, and enclosed in a handsome box of triptych form, made of coromandel wood, mounted with heavy ornate hinges, ornamental clasps, and monogram in Mediseval style, made by Leuchars & Son, of Piccadilly. To add to the satisfaction of Mr. Gibbs at receiving such a testimonial of his long and useful labours in connexion with the Club, the Prince of Wales graciously undertook to make the presentation in person. The Royal party, with the members of the council of the club, Mr. Gibbs, Mr. R. Leeds, Mr. Sidney, Professor Simonds, Mr. Beck, and other gentlemen, being assembled in the board-room, the resolution was read. It was headed "Smithfield Club. President, his Royal Highness the Prince of Wales, K.G. At a general meeting of the members, held Dec. 7, 1875, resolved unanimously that a special vote of thanks be presented to Mr. B. T. Brandreth Gibbs on the occasion of his election, for the thirty-third time, as honorary secretary, in recognition of the interest he has taken in the club, and the valuable and efficient services he has rendered it for so many years." This engrossed copy was taken from the box by the Prince, who affixed his sign manual, and then placing it in Mr. Gibbs's hands, said,—"I have very great pleasure in presenting you with this very well-earned testimonial." Mr. Gibbs, in reply, said,—"I have to offer your Royal Highness my most sincere thanks for the very great honour you have done me in deigning to present this to me personally. The fact that it bears your Highness's signature also greatly enhances its value in my estimation."

**Disparity of Wages in London and Provincial Towns.**—The *Lytham and Kirkham Times* of the 29th ult., writing under the heading "The Building Trade," says that for a considerable time there has been an under-current of dissatisfaction amongst provincial artisans, arising from the disparity between the wages paid in London, and (say) in Liverpool, Manchester, and Leeds. "It is true, that this course of discontent has not, as yet, been brought prominently to the front, but that it exists, and is widely spreading, is beyond all question. Complaints are also rife in all of the trade unions respecting the imperfect arrangements that have been made with the view of equalising wages in different districts. We do not know, nor do we at present care to inquire, what grounds there are for the dissatisfaction and discontent. We have only to chronicle the fact, and further state that we are informed, upon unimpeachable authority, that by one branch at least, of the building trade, there is organising a strike to take place early next spring, which, if successful, will put upon a par the wages paid in London and those of a wide manufacturing district in Lancashire. It is said the demand made will be for tenpence per hour, and for the working time to be limited to forty-nine and a half hours per week. Notice of this impending strike has already been given by the officers of one or not more of the trade unions."

**The Thames Valley Drainage.**—Colonel Cox, the Local Government Inspector, reporting on the recent conference held on this question, says that, so far as the information before him enables him to form an opinion, it is that a scheme to unite for purposes of main sewerage Kingston, Surbiton, New Malden, Hampton Wick, Teddington, Twickenham, Richmond, Ham Common, East Molesey, parts of Kingston, and parts of Richmond Rural Sanitary Districts, is a practicable one, and one which it would be to the advantage of those districts to adopt. He accordingly suggests that the Local Government Board should direct a formal inquiry under section 279 of the Public Health Act on the application of the Hampton Wick Local Board, which would enable further information to be obtained so as to ensure that a decision may be come to as to whether or not a provisional order should be made forming a district.

**Burton-on-Trent Archaeological Society.** On the 5th inst. there was a general meeting of the members of this Society in the Grammar School, when Mr. W. Molyneux, F.G.S., read the first portion of an interesting paper on "The Old Bridge of Burton-on-Trent."

**London Water Companies.**—The certified expenditure of the eight metropolitan water companies down to the end of the year 1875 was as follows:—New River Company, 2,792,201l.; East London, 1,898,087l.; Southwark and Vauxhall, 1,766,904l.; Lambeth, 1,215,706l.; Grand Junction, 1,190,729l.; Chelsea, 979,973l.; West Middlesex, 916,696l.; Kent, 535,910l. The total is 11,296,206l. About 360,000l. of this amount had been expended in the course of the year 1875, and as further expenditure was required for improvements in storage, filtering, and distributory works, the aggregate capital laid out must by this time be nearer twelve than eleven millions. In reporting to the companies' accounts for the year 1875, Mr. Stoneham, the auditor appointed under the Water Act of 1871, notices the practice adopted by some companies of borrowing from their bankers for purposes of revenue, or habitually keeping in hand a balance of capital to be temporarily appropriated towards defraying current expenditure and carrying on the daily operations pending the collection of the water rents.

**The Thornton Viaduct, Bradford.**—The keystone of the last arch of the large viaduct at Thornton in connexion with the Bradford and Thornton Railway was laid by Mr. Isaac Wood on the 29th ult. The first arch was keyed on May 2, 1874. The viaduct is 280 yards in length, and is an S-curve, the curvatures being at the two extremities of the viaduct. It is composed of twenty arches, each of 40 ft. span, the greatest depth being 108 ft. to the bottom of the Pinchbeck Stream, about 17,000 cubic yards of masonry, and three-quarters of a million bricks being used. The stone has been supplied from Messrs. Farrar's quarries at Bell Dean, and the bricks by Messrs. Thwaite, of Thornton. The engineer of the railway is Mr. John Fraser, and Mr. H. J. Fraser, resident engineer, from whose designs the viaduct has been built, and the work of construction has been under the supervision of Mr. Henry Wilson. Messrs. Benton & Woodiwise are the chief contractors for the line, their manager being Mr. E. Shaw.

**Reported Discoveries by Dr. Schliemann.** The following copy of a telegram from Dr. Schliemann to the King of the Hellenes has been received at the London office of the *New York Herald*:—

"To his Majesty King George.  
With unbounded joy I announce to your Majesty that I have discovered the monuments which tradition, as related by Pausanias, points out as the tombs of Agamemnon, Cassandra, Eurymedon, and their companions, who were all killed whilst feasting at a banquet by Clytemnestra and her lover, Agisthus. These tombs are surrounded by a double parallel circle of tablets, which were undoubtedly erected in honour of those great personages. In these tombs I have found an immense archaeological treasure of various articles of pure gold; this treasure is alone sufficient to fill a large museum, which will be the most splendid in the world, and which in all succeeding ages will attract to Greece thousands of strangers from every land. As I am labouring from a pure and simple love for science I waive all claim to this treasure, which I offer with intense enthusiasm in its entirety to Greece. Sire! May these treasures, with God's blessing, form the cornerstone of immense national wealth."

DR. HENRI SCHLIEMANN.

Mycenæ, Nov. 29, 1876."

**Crystal Palace.**—The dramatic season of 1876 at the Crystal Palace has been one of unusual activity, and its close has been marked by an event that may be justly claimed as one of considerable importance, namely, the production, for the first time on the English stage, of Euripides's drama "Alcestis," with Mr. Henry Gadsby's music to the choruses. The revival of Sophocles's "Antigone," with Mendelssohn's music, led to the first English stage performance of the same great tragedian's "Oedipus at Colonus," also with Mendelssohn's music; but the performance of "Alcestis" has an interest surpassing that attaching to the performance of its predecessors, as not being a rendering of an English version of a German version of the original, but an attempt to represent a Greek play by means of a direct English translation, and with music by an English composer.

**A Contractor committed for "Man-slaughter."**—The Coroner for the borough of Windsor has concluded an inquiry respecting the death of Francis Tarrant, who was killed by falling from the steeple of the Wesleyan Chapel now in course of erection on St. James's walk. Mr. Geo. Reavell, the contractor, was examined. The jury, after deliberation, came to the conclusion that "Mr. Reavell had been guilty of culpable neglect," which, the Coroner said, amounted to a verdict of manslaughter. Mr. Reavell was formally committed for trial.

**New Skating-rink at Nottingham.**—A new skating-rink, called the "Alexandra," has just been opened at Nottingham. It covers an area of 1,235 square yards, but an additional 600 yards have been secured with the object of establishing an outdoor rink. The building is a brick structure 60 ft. high, and the shape of the interior is described as that of a diamond or lozenge. The skating surface is of asphalt, supplied by the Birmingham Val de Travers Company, and it covers the large area of 9,500 square feet. The architects were Messrs. Evans & Jolly; the builders for the brickwork, Mr. Frederick Messon; for the woodwork, Messrs. Knight & Hammersley; while the iron roof was supplied by Messrs. Handyside, of Derby; the plumbing was executed by Mr. Cordon, and the painting work by Mr. Gascoyne, jun.

**Discovery of Mica.**—The *New York Times* states that the schooner *Era*, which was despatched by a Philadelphia company a few months ago to Cumberland Bay, Baffin's Land, in search of graphite and mica, has returned from her expedition. The *Era*, which was under the command of Lieutenant Mintzer, of the United States navy, arrived at the place known by whalers as the Nialtic Valley, where the crew, which consisted of thirty men, established a tramway and working sheds. The mica was found in veins 10 ft. below the surface, and some of the blocks brought back by the Mintzer expedition are of great size and purity, being nearly 20 in. square and weighing 50 lb. Altogether the crew of the *Era* obtained 15 tons of mica, and to do this exhausted three veins. The mica is estimated to be worth from \$5 to \$12 a pound.

**The Burns Monument, Glasgow.**—At a recent meeting of the committee entrusted with the erection of a monument to Burns in Glasgow, it was stated to be the intention of the committee to place four bas-reliefs on the pedestal of the statue. These reliefs are intended to represent the "Cottar's Saturday Night," "Tam o'Shanter," "The Twa Dogs," and "The Vision." Mr. Ewing has these reliefs in hand. In answer to inquiries, Messrs. Cox & Son, the founders, in London, had written saying that the cast of the statue had been one of the most perfect they had ever produced, and that they expected to have it ready for delivery by the end of December. Messrs. Meldrum Brothers, Dumfries, had also written, stating that the pedestal would be finished early in January.

**Schools: Shepton Mallet.**—New schools for the accommodation of 190 children, with master's house, and the necessary offices, have been erected and opened at Kilver-street, one of the outlying districts of the town. They are intended to be used on Sundays as a chapel of ease, the architects having considered the twofold object in planning the buildings. The buildings are constructed of local lias stone, with Douling stone dressings; the roofs of the schools are open timbered (pitch-pine), and covered with Bridgewater flat tiles and ornamental bands. The cost of the works is about 1,500l. This has been raised by voluntary contributions. Thus the necessity of a School Board and the burden of a rate have been superseded. The architects are Messrs. C. & J. Wainwright, and the builder is Mr. Luke Stock, all of Shepton Mallet.

**Fine Art Exhibition for Derby.**—Next year (says a Derby paper) will witness the realisation of an addition to our educational buildings, in the opening of the new School of Art, on Green-hill, when the work of the school will in future be pursued under every advantage for the study of art. The committee find that they have at their disposal about 8,000 square feet of hanging space. It is proposed to form an exhibition of works borrowed for the purpose, and of pictures exhibited by the artists themselves. An effort will be made to make a marked feature of high-class modern water-colour art. The officials of the Science and Art Department have promised a collection from the South Kensington Museum.

**Destruction of the Nottingham County Hall by Fire.**—On the night of the 1st inst. the County Hall at Nottingham was almost totally destroyed by fire. Of the old court, nothing remains but the bare and blackened walls, and the roof of the spacious new court which has lately been erected was burnt away, while the interior was greatly damaged. The fire is attributed to the over-heating of the flue in the old court. The damage is estimated at about 20,000l.



**Redditch Sewerage.**—At the last meeting of the Local Board at Redditch, on the 4th inst., it was resolved that Messrs. Gotto & Beesley's plan for the drainage of the town be adopted, and that the plan for Headless Cross be adopted, subject to certain modifications to be arranged between the engineers and the Public Works Committee. The Clerk was instructed to give formal notice to the Local Commissioners that a sum not exceeding 10,000l. would probably be required for drainage, and to request the Local Government Board to send an inspector to examine and report on the adopted plans.

**Darlaston.**—On the 27th ult., two stones commemorative of the restoration of the Wesleyan Chapel, Darlaston, were laid by Mr. J. Taylor, of Knowle, and Mr. E. Horton, of Darlaston, in the porch of the structure. The restoration is to be complete, and it will include the raising of the front elevation and the addition of a porch, and the entire remodelling of the interior, with the decoration of the ceiling and the wall spaces, the total cost of the work being estimated to amount to 2,500l.

**The Mansion-House Cistern.**—The dreadful condition of the principal cistern in the residence of the Lord Mayor of London has been described in all the newspapers. We hope this occurrence will lead some of our readers to look to their own cisterns, and, above all things, to see that they have no connexion with the house-drains.

**The Town Council of the Borough of South Shields** have agreed, upon the application of Mr. Matthew Hall, borough surveyor, to pay him a commission of 2½ per cent. for carrying out the sewerage of new building estates, as private improvement expenses. Mr. Hall is also authorised to appoint a special inspector for the works, at a salary of two guineas per week.

**Sewage Disposal at Bristol.**—The Bristol Town Council have resolved to purchase the Clift House Estate, near that city, for about 7,000l., with the object of using it for receiving and disposing of the sewage of the city, which, under the Rivers Pollution Act, can be no longer allowed to enter the tidal river.

### TENDERS

For the erection of house, offices, and stables, Steventon Manor, near Middelbury, Hants, for Mr. H. Harris. Mr. R. Morrison Marneock, architect. Mr. Geo. Fleetwood, surveyor:—

Hale & Son	£27,274 0 0
Futcher	26,023 0 0
Patman & Fotheringham	24,470 0 0
Hill, Higges, & Hill	24,200 0 0
Trollope	24,067 0 0
Holland & Hannen	23,379 0 0
Hayward	23,299 0 0
Brass	22,622 0 0
Ball & Son	20,778 0 0

For alterations and additions to South Bank, Surbiton Hill, for Mr. Wilberforce Bryant. Mr. Rowland Plumber, architect. Messrs. Fowler & Hugman, surveyors:—

Nightingale	£3,783 0 0
Conder	8,381 0 0
Hill, Higges, & Hill	8,180 0 0
Kilby	8,047 0 0
Sewell	7,870 0 0
Dove Bros.	7,803 0 0
Moreland & Nixon	7,767 0 0
Messon	7,687 0 0
Adamson & Sons	7,696 0 0

For subway to retort-house, cart-shed, and verandah to office window, at the Folkestone Gas and Coke Company's Works. Messrs. Burgess & Reeve, architects:—

Prebble	£209 0 0
Newman	187 0 0
Hoad	185 0 0
Clements	184 0 0
Webster	163 0 0
Dunks	138 10 0
Holden	133 0 0
Butler (accepted)	128 0 0

For additions to residence, at Trewyn, near Abergeenny, for Mr. J. L. Risher. Mr. E. H. Lingen-Barker, architect:—

Biggs (accepted)	£1,155 0 0
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For a pair of villa residences and stabling, at Basingstoke. Quantities supplied. Mr. J. H. Moore, architect:—

Oliver	£1,630 0 0
Budden	1,622 0 0
Barnes	1,363 0 0
Allen	1,380 0 0
Charlton	1,232 0 0
Smith	1,143 0 0

For additions to the Osborne Hotel, Clacton-on-Sea. Mr. Horace Darken, architect:—

Pollard	£665 11 6
Cauler Bros. (accepted)	698 0 0

For alterations and improvements to the Lion Inn, Wivenhoe, for Messrs. A. T. Osborne & Co. Mr. Darken, architect:—

Barrell	£218 10 6
Pitt	218 0 0
Smith (accepted)	216 0 0

For painting works to warehouse, Old Change, for Messrs. Sharp, Perrin, & Co. Pitman & Cuthbertson (accepted) £294 10 0

For building carriage factory, Islington-green, for Mr. Brooksbank. Mr. A. C. Bean, architect. Quantities supplied:—

Dove Brothers	£3,873 0 0
Roberts (too late)	3,843 0 0
Adamson & Sons	3,487 0 0
Johnson	3,353 0 0
Carter	3,230 0 0
Bayes Brothers & Allen	2,915 0 0

\* Accepted.

For sewerage of new building estates, near Westo South Shields. Mr. Matthew Hall, surveyor:—

Lancaster	£2,220 0 0
Winter	1,877 13 9
Kennedy	1,893 12 0
Copeland	1,768 0 0
Beil	1,675 8 4
Harvey	1,651 13 0
Suddards	1,623 0 0
Marshall	1,360 10 0
Craig (accepted)	1,304 10 3

For sewerage of new building estates, on the Shields Heugh Estate. Mr. Matthew Hall, surveyor:—

No. 1 Contract.	
Marshall	£905 7 2
Suddards	880 4 11
Copeland	768 0 0
Craig (accepted)	768 13 0
No. 2 Contract.	
Marshall	£466 17 5
Suddards	455 2 4
Copeland	420 0 0
Craig	406 10 4

For new buildings, High-street, Shoreditch. Messrs. Fowler & Hill, architects. Quantities by Messrs. Fowler & Hugman:—

Brass	£6,793 0 0
Palmer	6,699 10 0
Hill, Higges, & Hill	6,240 0 0
Wagner (accepted)	5,178 0 0

For a villa residence, at Stockwell-end, Tottenhall, for Mr. G. H. Perry. Mr. J. R. Veall, architect:—

Lovatt (accepted)	£2,400 0 0
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For the erection of the Cavendish Fireproof block of buildings, at Derby, for the Midland Improved Industrial Dwellings Association (Limited). Mr. Geo. K. Isborn, architect. Quantities supplied:—

Bell & Son	£12,476 0 0
Stevenson	12,380 0 0
Deggett & Co.	12,253 0 0
Baker	12,106 0 0
J. & E. Wood	11,598 15 0

For additions and alterations to Temple, Great Marlow, the seat of Colonel Owen Williams. Sand, ballast, &c., provided. Mr. W. H. Powell, architect. Quantities supplied by Mr. Thomas Ladds:—

Brass	£3,893 0 0
Trollope	3,697 0 0
Shaw (accepted)	3,000 0 0

For the erection of warehouse in Cannon-street, for Mr. H. Woods. Messrs. Taylor & Locke, architects. Quantities by Mr. W. Birdseye:—

Newman & Mann	£5,086 0 0
Browne & Robinson	4,992 0 0
Deards	4,888 0 0
Brass	4,880 0 0
Kilby	4,830 0 0
Shepherd	4,800 0 0
Sawell & Sons	4,792 0 0
Mortier (accepted)	4,650 0 0

For the erection of warehouse, Cannon-street, for Messrs. J. Brook & Bros. Messrs. Taylor & Locke, architects. Quantities by Mr. W. Birdseye:—

Browne & Robinson	£4,761 0 0
Newman & Mann	4,699 0 0
Deards	4,627 0 0
Brass	4,594 0 0
Shepherd	4,500 0 0
Sawell	4,488 0 0
Kilby	4,456 0 0
Mortier (accepted)	4,214 0 0

For rebuilding warehouse, Cannon-street, for Messrs. C. & J. P. Potter. Messrs. Taylor & Locke, architects. Quantities by Mr. W. Birdseye:—

Newman & Mann	£4,790 0 0
Browne & Robinson	4,631 0 0
Brass	4,492 0 0
Sawell & Sons	4,426 0 0
Shepherd	4,400 0 0
Deards	4,397 0 0
Kilby	4,340 0 0
Mortier (accepted)	4,343 0 0

For rebuilding the Skinners' Arms, Cannon-street, for Messrs. Chapman Bros. Messrs. Taylor & Locke, architects. Quantities by Mr. W. Birdseye:—

Newman & Mann	£7,798 0 0
Browne & Robinson	7,764 0 0
Brass	7,665 0 0
Deards	7,485 0 0
Sawell & Sons	7,454 0 0
Kilby	7,350 0 0
Shepherd	7,100 0 0
Mortier (accepted)	6,994 0 0

For rebuilding 5, Bow-lane, for Mr. H. Woods. Messrs. Taylor & Locke, architects. Quantities by Mr. E. Overall:—

Farrell	£1,300 0 0
Kilby	893 0 0
Mortier	890 0 0
Sawell & Sons	885 0 0
Shepherd	860 0 0
Woods	789 0 0
Beeton (accepted)	729 0 0

For rebuilding a warehouse, Goldsmith-street, City. Messrs. Ford & Hesketh, architects:—

Boyes (accepted)	£1,971 0 0
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For additions and alterations to City. Messrs. Ford & Hesketh, architects:—

Peto Bros.	£1,000 0 0
Lawrence	900 0 0
Ashby Bros.	800 0 0
Browne & Robinson	700 0 0
Perry Bros.	600 0 0
Conder	500 0 0
Dove Bros.	400 0 0
Brass	300 0 0
Shaw (accepted)	200 0 0

For rebuilding two warehouses, Messrs. Ford & Hesketh, architects:—

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# The Builder.

VOL. XXXIV. No. 1789.

SATURDAY, DECEMBER 30, 1876.

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### Retrospective.

If we record the close of a year, prolific of promise, admonition, and discourse, with some little discontent and impatience, we do but acknowledge the inflexible law which prescribes that state of feeling as the necessary accompaniment of progress; and it is satisfactory to remember Macaulay's dictum that there is constant improvement because there is constant discontent. The year opened with rumour of great changes in the aspect of poorer London from the salutary influence of a special Act of Parliament, and closes with little, if any, substantial evidence of its action. Societies, asso-

cations, companies, commercially philanthropic in their origin and progress, have announced the possible advent of benefit to the population by the judicious purchase of worn-out houses, and the scientific covering of lands long encumbered and ill-administered; but the twelve hundred and odd pages of this thirty-fourth annual *Builder* tell of few radical alterations or improvements in the housing of families and the economical distribution of homes, either in the metropolis or in the great manufacturing centres of the country. Much discussion has been expended upon the advantages which the Artisans' Dwellings Act was passed to confer; but with the nature of those advantages the public is still precluded from becoming practically acquainted. At the same time we are far from wishing to condemn the delay which has occurred in the execution of schemes both public and private; nor would we for a moment disparage the value of the many communications and suggestions which have been made by thoughtful people of all kinds and callings respecting the better ordering of cities, and the social as well as legal application of sanitary laws. To us whose business it is to write and talk about these things, it is peculiarly gratifying to find that the example of Dr. Richardson,—who, last year, left his own beaten track to help architects and builders to mend theirs,—has been followed, in this, by numerous imitators in essays of a similar character; and that both the Society of Arts and the Social Science Association have moved on the urgent necessity for better legislative interference in matters of health and sewage and of house construction than has yet been obtained from the wisdom of Parliament.

Such a vexed question as the present unequal and often contradictory laws affecting the construction of buildings throughout the country was not omitted from the discussions of the Conference held last June in London by a fairly representative number of British architects. The meeting convened to consider the "Building Regulations for the United Kingdom" was presided over by Mr. Whichcord; and within the last few days a committee, of which this gentleman was also chairman, has completed a document for the use of the Local Government Board, which will enable the latter to apply generally a system of building regulations to all towns in the kingdom, if it so choose, and if Parliament consent. The first event of the Conference of Architects was the presentation to M. J. L. Duc, of the Queen's Gold Medal; and it was followed, the next day, by a discussion upon "Improved Dwellings" under the presidency of the conductor of this journal. The papers thereon treated of houses for the poorer classes, but it cannot be too often repeated that improvement in London to be lasting and effectual must be aimed at all and every one; and that the middle and even the higher classes have as much right,—and, in some instances, as much need,—to share in the benefit of scientific improvement as the lower ones. For long years to come the question in too many neighbourhoods must remain one of building rather than of architecture. It is clearly certain,—however uncertain things relating to art often are,—that a comfortable and healthful interior is of primary, an elegant exterior of secondary, importance. During the Conference, the architects devoted an evening to the rekindling, in the hope of some Classical re-culture, of Greek enthusiasm; and no surer proof of the distaste which thinking men must feel for the vagaries of a still popular school can be given than by the evident inclination to examine once more those early principles which the Greek, perhaps unconsciously, evolved from his common-sense practice and the utilitarian nature of his invention. The lectures delivered at the Royal Academy by Mr. Edward Barry have treated the subject of architecture in an argumentative and a scholarly fashion; and we cannot speak with too encouraging an emphasis of that section of current literature,—of which they form a part,—which bases the future of artistic construction and decoration upon a broader foundation of scientific knowledge than is at present deemed necessary to the professional man. Nor, if discussions at the Royal Institute of British Architects lead, as those upon "Concrete" have recently led, to so practical a termination as the appointment of a committee for the purpose of drawing up a report to a select Parliamentary one, can we doubt that many others hold a like opinion to our own,—and this step is due, we believe, to the suggestion of Lord Elcho.

It would be Quixotic to hope that the not-improbable passing of a good Building Act will be accompanied by a serious disposition on the

part of the House of Commons to inquire into, if not to reform, the abuses of divided and irresponsible government in a colossal metropolis. Those abuses too often fester to the public cost and disadvantage from the fact that sometimes the honorary officials who should correct them are interested in their continuance. Nor is the vaunted English fashion of decentralisation always a bar to those acute practices which, in over-centralised Paris, swallowed up a *prefet*, and ultimately contributed to destroy an empire. In the French capital, when the cutting of a new street was often apparently decided upon one week and effected the next, official secrets were marketable; and the scandalous news that property, doomed to expropriation and certain of consequent compensation and eventual increase of value, had been previously bought by a friend of the *prefet* or another high-placed official was complacently received with the usual shrug of helplessness and intelligence. Nor was the would-be speculator, who paid his court to certain members of the board or commission in the hope of getting early news, always successful; for the latter were sometimes purchasers of the very land they had been deputed to sell for the public benefit. The Parisians, it is well known, condoned the even open corruption while the rebuilding of their beautiful city presented accumulated proofs of the benefits they derived therefrom; but London alterations, even the best, have not exhibited similar, or, at least, equal, proofs; nor can it be expected that metropolitan improvements will be effected here with the artistic completeness of Paris. There is, therefore, the more reason why Londoners, once convinced of the fact, are unlikely to tolerate any emulation, however distant, of the practices of a fallen French administration; nor do we think such emulation possible in the few building schemes which have been lately projected in London, or the few sales of public lands which have recently aroused the attention of a limited circle of onlookers.

The present state of London affords material for innumerable reflections upon the cause, and the means of remedying the worst, of the evils which impede improvement. We have noted the recent check to the increase of its area. In a quarter of a century—from 1849 to 1874—more than 270,000 houses are declared to have been added to London, making an average of 10,813 houses per annum; and in one particular year of commercial activity at least 18,000 were built. But although in 1876 and the preceding year, nothing like these figures have been attained or even expected, the increase of accommodation is in excess of the increase of persons to be accommodated. Nor, seeing the great waste of property which parts of Central London present, can it be desirable, at least for some time to come, to increase the metropolitan area. Although the value of land near Charing-cross has been confirmed by the prices secured upon a small part of Northumberland-avenue, whole acres in the immediate neighbourhood are occupied by low, ill-built houses. A glance at the map, and at



The condition of the greater number of the tenements which obstruct the making of a long-talked-of high thoroughfare from Trafalgar-square to Oxford-street suffices to show, not only the continued blindness of the landowner, but, which is worse, the mischievous consequences of leasehold custom and abuse. It is said, with some appearance of truth, that the great obstacle to street reforms and building improvements lies in the difficulty, due to many and conflicting interests, of initiating them. To suggest to the Duke of Bedford that he should pull down Bedford-bury—and this vitiated thoroughfare has been frequently condemned in circolumens—is to invite the answer that a hundred and more individuals have vested rights in the rickety, overcrowded, and valuable houses; and that improvement must bide its time. We presume to think, however, that that time ought not at any cost to be delayed; and that the landowners on either side of the Strand, and particularly those who own the island flanking Holywell-street, between the churches of St. Mary and St. Clement, may conveniently take steps, without further hesitation, to render the houses which cover their land fit for the tenants who are compelled, so to speak, to occupy them.

That ever-crowded highway, once, and comparatively not long ago, the only road from the City to Westminster, continues a checkered scene of chronic disturbance. The removal, however, of Temple Bar is happily imminent. The present occupiers of the dilapidated room over the central arch have received formal notice to quit; and the widening of that part of Fleet-street and the Strand will assist in calling attention to the increasing difficulties of passage through the straits formed by the churches and the curved alignment of the neighbouring houses. It is a consolation to remember that the traditional dirtiness of a thoroughfare which originally served as the land approach to palaces of the nobility is subject of historical record. A hundred years ago stones, for which an even and less noisy surface of wood and asphalt is now being substituted, were first laid down in lieu of mud and mire. The new pavement appears to have been executed with even more care than that expended upon Northumberland-avenue. The opening of this thoroughfare, which last March afforded an opportunity of congratulatory satisfaction to the members of the Metropolitan Board of Works, has not been followed by any activity on either side of it; and the western extremity of the Strand now presents an appearance not dissimilar to that which its eastern end but lately offered, even for years, to the gaze of a patient population.

But at last the New Law Courts are rising; and so much has been done during these twelve months as to favour a hope that the Office Block, which flanks Bell-yard, and is nearly 500 ft. long, will be completed by the stipulated time. Three stories of this block have been executed since the Spring; and, besides, the roof has just been fixed and boarded. Greater progress would possibly have been made in this portion of the building had not the after-thought of ornamental brickwork for the chimney-shafts retarded nearly every description of labour engaged upon it. These red bricks, both plain and moulded, are made at Southampton by Messrs. Bull, the contractors for the whole building. To their skill and energy is due the organisation by which the work is at present conducted, as it were, in a groove and with mechanical regularity. To their general foreman, Mr. Epps, has been confided the design and erection of the scaffolding, itself alone a work of magnitude, and composed wholly of large timbers. Their first care, after having erected offices and a shelter for themselves, was to build a house for the reception of a couple of steam engines. By this means more than twenty saw-frames, each fitted with a number of blades, are almost constantly in motion; together with several mechanical tables for rubbing stone, and to every couple of these tables, which are of cast-iron, is fixed a hand-crank for lifting materials upon them. The "beds" of each stone are rubbed upon these tables, though necessarily all the faces and mouldings are worked and rubbed by hand. No Bath stone is used; the quarries of Portland and of Hopton Wood have mainly supplied the requisite materials. All the masons' shop-yards, protected from wind and rain, are lighted by gas; and each, containing a certain number of workmen, is presided over by a special foreman. The mode of reception and carriage of blocks of

stone, under every phase of workmanship and of all sizes, is neither uninteresting nor old. Three steam-travellers are used, and they roll upon two distinct "gantries," which, for the benefit of some of our readers, are large timber scaffoldings framed together and tied with iron. First, the traveller takes the rough block from off the wagon in which it is brought to the spot; and it lays this block with others in the pack. As occasion requires, the traveller proceeds to the said pack, and taking up a rough stone, conveys it to the sawing-frame, where it is cut into sizes according to prescription. The next thing it does is to carry the sawn stones to the different masons' shops, where, after having been worked by hand into the requisite form, and often into complicated mouldings, they are pushed along narrow-gauge tramways by labourers, specially employed for the purpose, to the lower parts of the new building. These worked stones are then raised by steam-hoists to points on the scaffolding, from which they are conveyed along similar tramways to their destination. Other smaller travellers assist in fixing the stones in their place upon the walls. But before this half-mechanical, half-manual work can be begun, a different kind of labour has to be carefully accomplished. Over the engine-house is a masons' "lodge," or "*œuvre*," in which the templets, or, in language of millinery, the shapes of each stone, are prepared by a special staff. This department is superintended by the chief foreman of the masons, Mr. Clark. There copies of the architect's drawings are to be found. Bit by bit these are redrawn to a large scale upon paper; the jointing is thus arranged, and each stone is carefully numbered. These drawings are afterwards enlarged to real size upon a perpendicular surface, composed of upright boards, planed and whitened, instead of the method, more generally adopted in England, of setting out masonry upon a floor. From the full-sized diagram a templet is cut in zinc to the shape of each stone, it being a rule that the men who make these drawings shall also cut the templets. Plaster models of groining and of complicated bits of stonework are also put together in the "lodge"; and we must not omit to state that much of this part of the organisation—especially the numbering, comparing, referencing, and, indeed, the general interpreting of the architect's numerous drawings by Mr. Monday—is an undoubted innovation, and almost special to the New Law Courts. Although a critic who knows men and countries is wisely cautious about vaunting the progress or capabilities of his own race or nation, we venture to affirm that in the great building-days, at no remote date, of the French capital, no *chantier* of equally scientific arrangement was ever seen in working order comparable to that which is enclosed between Temple Bar and Carey-street.

Along this same thoroughfare of the Strand flock nightly eager crowds of people who frequent theatres concealed behind the houses and shops which line it. The imminent dangers from fire and panic which hang over them are not brought home to possible victims by disasters, however terrible, reported from abroad. But the pursuit of pleasure in a metropolitan theatre is burdened with the same risks as those which were accepted at Brooklyn, in the United States, by 800 miserable spectators, 300 of whom have just met, at one swoop, a violent and an aggravated death. We have frequently called attention, and not always without effect, to the insecure condition and imperfect arrangements of many London theatres, both new and old. The example set this year by the German Government might be advantageously followed in England; and a serious inquiry into the constructive character of all such places of nightly resort would, we feel convinced, bring before the public excellent reasons for not frequenting several attractive entertainments. The actual provision, condoned by the reticence of authority, for the protection of men, women, and children, wedged together inside a London theatre, is of the most primitive description, and it may perhaps be useful to hint again to an exalted functionary that to issue a command is one thing, but to get it executed is another. On the very night that the recent reminder of the Lord Chamberlain's former memorandum to the various managers and lessees was communicated to the press, the pit gangways of the Olympic Theatre were encumbered with standing spectators, and nevertheless money was still accepted at the doors. The gangways of the best and only old-fashioned pit in town, that of the Haymarket, are systemati-

cally made profitable as standing-room. It may be doubted, however, whether an attempt, even if it be successful, to keep gangways clear is sufficient to afford a means of escape in case of panic. We have but to take three of the comparatively new theatres to show the slight security obtained by such a precaution. The pit of the Globe Theatre, sunk far below the level of the street, is so planned that the only entrance and exit for the occupants is at one corner, and by means of a narrow flight of steps; the upper boxes of the Vaudeville Theatre are similarly and even worse situated, for there is no gangway, and it is difficult, even with the utmost patience, for the "off" half of the spectators to make a way through the "near" half. Equal anxiety, though for a different reason, attends the possibility of any sudden rush from parts of the Gaiety Theatre,—perhaps the best, or one of the best, managed houses in London. The stairs, leading to the dress-circle, upper boxes, and amphitheatre, are of naked stone, supported, at one end only, in the wall of the staircase. An iron railing is fixed at the other end as a guard to the large open "well-hole" in the middle. An alarm of fire would cause a rush to be made from the amphitheatre and the upper boxes simultaneously down the top flight; while the lower one would be choked with people rushing from the dress-circle. There would be inevitable squeezes in different parts sufficient to force the railing, and precipitate many into the "well-hole,"—as at Brooklyn; and, as the fire reached the staircase, the naked stones would succumb to the flames, dropping in flakes upon any fallen unfortunates who may be lying below—as, we believe, happened at Brooklyn. It is not our wish to sensationalise over the dangers which have been, and probably will long continue to be, incurred by theatre-goers in London; but we think that had a competent censorship of plans, as well as plays, existed before many of the present theatres were built, the public would thereby have been gainers. It is, however, not too late now to order a scientific inspection of them, and compel such a re-arrangement of seats as to secure the distribution of wide gangways, to be kept clear by the aid of the police; and, above all things, to withdraw the licence from those houses in which the means of ingress and exit are palpably and suicidally insufficient.

It will be seen, on reference to our description of the new Wagner Theatre at Bayreuth, that an exceptionally large space is there devoted to the comfort of the audience and to their means of escape in the event of necessity. Constructed of solid stone, it holds 1,344 commodious seats, and there are twelve places of exit, whereby the people can quit the building in even a few minutes. Several new theatres recently erected in various parts of the Continent have been illustrated in our pages during the course of this year. That of Athens has a charming Neo-Greek exterior, and is an excellent addition to the group of similar architectural edifices which adorn the modern city. Views of the new theatre and the new opera-house at Buda-Pest, the new theatre at Düsseldorf, a circus at St. Petersburg, another at Berlin, have been given by us. Nor have we failed to present our readers with some description, pictorial and verbal, of remarkable buildings, both small and great, which are rising, or have just risen, in cities remote and near. The Votive Church of Vienna is a striking example of modern architectural adaptation, and of the skill and learning with which Mediaeval precedents are now applied almost everywhere in Europe. The new Town-hall of Manchester will surely add increased lustre to the already-brilliant reputation of Mr. Waterhouse. The new Town-hall of Philadelphia is of imposing character and dimensions. An International Exhibition, held in that city, has appropriately celebrated the hundredth year of American independence, and afforded many Englishmen an opportunity of visiting the new world; while, in the old, a similar Exhibition though of a different character, held at Brussels, is admitted to have been as interesting as it was novel and remarkable.

The restoration, if not the re-building, of Chester Cathedral has been successfully accomplished by Sir Gilbert Scott, and the completion by the same architect of that of St. Alban's Abbey is no longer rendered doubtful from want of the necessary funds.

In Liverpool, Mr. J. A. Picton, as president of the Architectural Society, delivered an admirable address. That of the president of the Royal Institute of British Architects was equally dis-



tinguished for the good sense it embodied, and the good taste it evinced. His remarks upon the present state of architectural competition, unintentionally seconded by Sir Edmund Beckett in his recent book, pointed to the often unscrupulous speculation which the actual system, or defiance of system, favours. The exhortation that professional brethren should make it a point of honour "to refrain from all artifices of drawing, misleading estimates, or from showy and inflated descriptions which may be calculated to mislead the very singular and frequently incompetent bodies who affect to act as judges," is eminently suggestive. That this sort of competition is simply a trial of skill and pictorial device between men who work not up to their own, but down to the public taste, is quite intelligible to many Parisians. The French architects have received Mr. Charles Barry's condemnation of "the baleful system of competition" with wonder and opposition; but in no part of France are architectural competitions carried on as they are in this country. The temperance of our neighbours naturally inclines to an admiration for theories, but they have only to put in practice for twelve months a system which has flourished here, perhaps in its greatest vigour, for twenty years, to add their unqualified condemnation of it to our own.

Many of the addresses to kindred societies have been equally happy. From one end of the country to the other a singularly hot season preceded, and even accompanied, the recreative labours of a legion of archaeologists. Of all the numerous excursions, that into Cornwall was the most successful; and perhaps this was due as much to the energy and activity of the Association and its leaders, as to the novel and unhackneyed character of the ground which was explored.

The yearly meeting of the prophets and disciples of Social Science produced an inevitable flood of talk, which, from the enforced distribution of those who attend a congress in several rooms, would be almost entirely thrown away were it not for the diligence of the press. We have done our part in recording what passed in St. George's Hall, more especially in the Health and Art sections, and have but recently terminated our comments thereon. Firm believers in the progress,—slow, no doubt,—which has attended the teaching and remembrance of sanitary and art reformers for the last thirty or forty years, we have, nevertheless, attentively listened to Mr. Hawkesley and the Rev. Mark Pattison, who think otherwise, and whose remarks are always respectfully received. The latter, at Oxford, has expressed his approval of Mr. Poynter's assertion that mechanical production is opposed to art production, and we see no reason to doubt the truth of it; but, just as the machinery of 1866 produced more artistic things than that of 1856, so the machinery of 1876 has provided the many, and at slight cost, with better shaped and better ornamented objects than that of ten years earlier. Mr. Hawkesley admitted that "the natural term of life of our urban population is unnaturally shortened by preventable causes to the extent of one-fifth"; but he sought for these preventable causes, "not in the water-pipes and sewers, but chiefly in the homes and habits of the industrial classes." We think that he admits, however, only half the truth; and his arguments are powerless to shake our mature conviction that it is possible to protect, if not to lengthen, life, as much by habits of cleanliness without, as of godliness within, the homes of the community at large.

Other papers upon other subjects, archaeological and architectural, have attracted attention, but few more than Mr. Fergusson's bold hypothesis regarding the enigma of the Erechtheum at Athens. We have printed the strictures of Dr. Forchhammer, of Kiel, upon it, and the English author's reply. To the latter is due one of the great books of the year. The history of "Indian and Eastern Architecture" is perhaps a work that of all living archaeologists only Mr. Fergusson could write. The "Habitations of Man in all Ages"—also a work of the year—touches, as M. Viollet-le-Duc alone can touch, without absolute inaccuracy upon happy probabilities of the past. He has been able, in the seclusion of his study, to draw Hindu architecture on a grand scale, without having seen its exquisite pettiness on the spot; and if he has erred in his pictures of Early Chinese and Egyptian architecture, he has always accurately maintained the existence of principles, possibly imperceptible to the original builders, which mark the construction of the best buildings in

all countries and in all ages until within comparatively recent times. The present moment lends to India and the City of the Great Mogul an enviable notoriety. The throne of the descendants of Tamerlane, vacant for twenty years, is again filled, and by the representative of a reigning European house, in the immediate presence of a splendour unsurpassed even in Oriental traditions; and, far and wide, of a prosperity beyond the dream of Akbar. Upon three continents—at Constantinople, at Suez, and at Delhi—lie, still half obscured, the solid foundations of a Second and more extended Empire of the East.

#### BRIDGE OR SUBWAY: REPORT OF THE SPECIAL COMMITTEE.

DURING a recent discussion we endeavoured to show that while, as a surveyor's question, it is manifestly unwise to think of widening London Bridge; as an engineering question such a proceeding would be decidedly unsafe. London Bridge was built under unusual difficulties, owing to the decision on the part of the City Authorities to leave the old bridge standing while the new one was in course of construction. The mode proposed by Mr. Rennie was to erect a temporary bridge to carry the traffic, and then to pull down the old bridge, and to erect the new one on the same site. As an engineering question, no doubt this was the best mode. The same remark applies to the plan of the approaches. There can be little doubt that the London traffic would at this moment be better served if Rennie's advice had been followed; and it is difficult to trace any advantage whatever as resulting from the maintenance of the old line to the latest moment, then to be altogether destroyed. One result of this obstinacy was so to complicate the difficulties of putting in the new foundations, that the limit of stability was very closely approached, and that even, for a short time, it appears to have been exceeded. The London abutment began to sink, when the masonry had reached a certain height; and although it came to a new bearing, and has since completion been perfectly durable, the indication was one that no engineer would dare to disregard. There is thus good reason, from the history of the actual building of the bridge, to anticipate that if a weight not contemplated by the designer or by the builder of the structure were thrown upon the foundations, the result would be damaging, and possibly destructive.

It is well to recall these important facts to public attention. They are not private opinions, but ascertained and recorded truths. We conclude that the former publication in our columns may have had much to do with the very desirable change that has come over the counsels of the authorities. Until, however, the matter is settled, beyond fear of reopening, it is desirable that they should be kept to the fore.

The question, then, now before the committee is as to the class of work which it is desirable to adopt for the crossing of the Thames to the east of London Bridge; the lightening of the traffic at that locality by such a measure being now regarded as a proven necessity.

The plans which have been brought before the committee, and as to which they have desired further time to enable them to report, may be divided into four main classes, according as they propose to cross the river by a bridge, by a ferry, by a ford, or by a tunnel.

The bridge plans may further be considered as either contemplating an ordinary bridge with inclined approaches, a swing or otherwise opening bridge, or a high-level bridge provided with hydraulic lifts for elevating and lowering the vehicles and passengers which make use of the communication.

As throwing light on the subject, "Mr. Architect" has prepared for the committee returns of the actual traffic over London Bridge, of the directions in which it approaches, and by which it diverges from that crossing, and of the number and character of the vessels passing up the River Thames westward of St. Katherine's Docks, with the height of their respective masts, from the 4th to the 11th of May, 1876, inclusive. This latter return is of value, as indicating the height to which the soffit of the central arch of a bridge not made to open must be raised above the level of the river, in order not to interfere with the tops of the loftiest masts. During the week in question, out of 144 vessels, one had a mast of 95 ft. high, and one a mast of 90 ft. As many as nine had 85-ft. masts. If these dimensions are taken (as would appear to be the

case from the form of the return); not from the flotation line, but from the decks of the respective vessels, something has to be added for that difference. The question will arise whether it is needful to have clearance at Trinity high-water level, or at half-flood; again, whether it is necessary to add 10 ft. to a clearance that is enough for 98 per cent. of the vessels using the river. These are points important to bring out. At all events, making allowance for the thickness of the bridge itself, we cannot reckon on a less height than 90 feet above Trinity high-water mark as the level of the roadway over the central arch of the new bridge; and this height, allowing a slight fall to either abutment, has to be regarded both as affecting the cost of the structure and that of its approaches, and as measuring the work done by the teams or single horses that make use of the proposed bridge.

On this part of the question the committee will do well to call upon "Mr. Architect" for the corresponding information with regard to the depth below the surface of the river at which a tunnel may be supposed to be practicable. A section of the river is required for this purpose, as well as a list of the draughts of the vessels passing, as in the previous case, above St. Katherine's Docks. The hydraulic movement of the Thames at the proposed spots must also be indicated. Again, the geological nature of the bed of the river must be ascertained. If we take Trinity high-water line as a datum, we have seen that 90 ft. have to be allowed above that level for the roadway of a fixed bridge. For depth below we must allow for the fall of the tide, say 22 ft.; for the draught of a laden vessel, say 35 ft.; for the crown of the tunnel, say 3 ft.; and for the clearance of the tunnel itself, say 18 ft. This gives a total of 78 ft., or 12 ft. less to descend than we had, in the former case, to ascend. But it must be observed that these dimensions, if possible for a subway, are not possible for what we usually understand as a tunnel. A certain thickness of soil beneath the bed of the river is essential for any process of tunnelling. A subway, with the soffit of its arch only 60 ft. below Trinity high-water line, could only be put in by coffer-dam, or by some process that would be equivalent to tunnelling, not through earth, but through water. Considering, then, the natural preference for a daylight line, the great extra risk and cost of the subway, and the necessary expense of pumping, to keep it dry, and of gas to light it, it does not seem to us probable that a gain of 12 ft. in the height to be ascended and descended on the approaches is such as to turn the balance, as far as the advantage of the land traffic is regarded, in favour of the subway. There is also a practical reason in favour of the bridge that deserves note. For the bridge, the traffic has first to ascend and then to descend. Any vehicle that can do the one can certainly do the other. For the subway the traffic has first to descend, and it is thus quite possible that a heavily-laden vehicle, which had easily made its way to the lower level, would be found too much for its horses on the ascent, and would thus cause an obstacle to the traffic.

Thus far we have regarded the land traffic. As far as the river commerce is concerned, there is no doubt that a subway would be preferable to a bridge. But it is the land traffic that has first to be considered. The return printed by the committee takes no note of the tonnage of the vessels enumerated; and the column headed "description" is filled up in a somewhat eccentric, not to say unintelligible, manner. Some vessels are therein called schooner, brigantine, or ketch, but we generally find the line in question filled by the letters P.S., or S.S., or by the numerals one, two, three, or five, which, are, we honestly confess, beyond our comprehension. As to the traffic over London Bridge, it is stated in the analysis of returns of traffic (p. 33 of the report), at about 7,800 vehicles of all kinds per day, from north to south, and about 7,600 ditto from south to north, making an average total of 15,200 vehicles daily crossing the bridge. But in the two weeks extending from Monday, the 25th of January, to Saturday, the 6th of February, 1876 (omitting the intervening Sunday), the total number of vehicles enumerated as crossing London Bridge averaged 19,161 per day, besides 121 led or ridden horses, and 104,159 foot-passengers. Observations of the lines of road from which this great body of traffic converges on London Bridge have led Mr. Horace Jones, the City architect, to the conclusion that 30 per cent. of the traffic now poured over this line of communication may be



diverted by the construction of an eastward crossing of the river.

With regard to the details of the different schemes submitted to the committee, they seem all to have the family likeness of either absence of estimate, or estimate which takes no account of the actual outlay which has been made on our principal Thames crossings, including the great tunnel at Rotherhithe. Mr. John Keith is the only designer who has proposed a subway. This he estimates at 163,346*l.* for the work, and 316,190*l.* for the approaches. This allows a sum of 222,800*l.* for the purchase of property for approaches which, so far as we can gather from the report, must exceed a mile in aggregate length. The length of the subway itself is not given in the report. That of the Rotherhithe tunnel is 400 yards, and the cost was 455,000*l.* The approaches of Waterloo Bridge cost 465,000*l.* The whole cost of that bridge, for works and land, was 1,030,000*l.*, and that of London Bridge was about 22,000*l.* less, as we stated in our article on the architecture of the Thames Bridges. (See *Builder*, September 23, 1876.) We must, therefore, regard any estimate of much less than a million of money for crossing the Thames to the east of London Bridge as based upon imagination rather than upon experience.

Mr. Guthrie, indeed, proposes to solve the difficulty for the extremely modest sum of 30,000*l.* He would lay a line of rails across the bed of the Thames, at a uniform or nearly uniform level, on which should run a framed staging or carriage with deck, offering, he says, very little resistance to the water, and projecting above the level of high water. The carriage would be driven by machinery, and move on the submerged lines between the two quays. The effect of the upward rush of the tide on a staging 55 ft. high may be more easily conceived than described. Less original than this submarine traveller is the simple project of Mr. E. Waller, to whose name the expression "Thames Steam Ferry Company" is significantly attached. He simply asks for two paddle-wheel steam ferry-boats, each 82 ft. long by 27 ft. wide between paddle-boxes, and capable of carrying twelve two-horse vans and 250 foot passengers, which are to ply to and fro between Irongate-stairs and Butler's Wharf, Shad Thames. Both north and south quays are to be made available at any state of the tide by hydraulic lifts, and all this is to be accomplished for 55,000*l.*, and 8,000*l.* per annum for working expenses.

Coming, now, to what we are likely to come to, in fact,—a bridge,—we have a project by Mr. Frederic Barnett, to form a double, or looped, bridge, on a low level, with swing galleries on the loop,—the idea being that when one of them was opened for the passage of a vessel the traffic would go over the other; the ship thus passing first into, and then out of, a sort of dock between the two galleries. The cost is estimated at about 400,000*l.*, but the Commissioners say that "only four of the parties give any estimate of the expense of carrying their designs into execution," and add that these four are Mr. Bruce, Mr. Duer, Mr. Keith, and Mr. Perrett. This is another of those little anomalies in the report on which we may expect to see some comment hereafter.

Mr. Bruce's design is that of a movable or roller bridge, 300 ft. long by 100 ft. wide, which is to move backwards and forwards on the top of six piers, which divide the river into seven spans or openings,—so that a portion of the water-way would always be open for vessels. Whether it is intended that the rolling platform shall remain on one side of the river until it has become filled with a line of vehicles going, for example, northward, then roll across and remain on the north side until the platform has been emptied and re-filled with a line of vehicles going southward, the analysis of "Mr. Architect" does not say. Probably this remark may elicit the reply that two alternating platforms each 50 ft. wide may be substituted for one of 100 ft. wide. But it would appear to be a result of such an arrangement that the vessels would have to pass as the case might be through the north or south landward openings, and that the inconvenience would thus be impartially distributed between the river and the road traffic. The cost of the construction is estimated at 134,381*l.*, with a further sum of 10,000*l.* as capitalisation of the working expenses. There is no estimate for approaches. The platform is to leave the same shore every six minutes, and to carry upwards of 100 vehicles and 1,400 foot-passengers.

Mr. Duer proposes a high-level bridge, with a pair of hydraulic hoists at each end to raise and lower the vehicles. He proposes to carry 250 vehicles in each direction over in an hour, besides foot-passengers. The cost of the bridge and hydraulic apparatus is estimated at 136,500*l.*, and the working expenses at 1,872*l.* per annum. As in the former case, no estimate is given for approaches. There is no doubt that in the case of a swing bridge, or bridge in any way worked by machinery, the cost of approaches would be comparatively small, and might, in fact, be more than covered by the increased value given to the property. And we think it is also clear that any movement which is confined to the accommodation of the land traffic alone, and which is thus freed from the risk of delay attendant on the passage of a vessel, would be less objectionable, both as regards land and water traffic, than any opening by swing or other bridge over the river. But it will require very much to induce the carriers and the travelling public to entrust themselves to hydraulic lifts, instead of making use of their own and their horses' feet to ascend the approaches of a bridge in a normal manner.

Mr. Perret also proposes a high-level bridge, with hydraulic hoists, to accommodate 350 vehicles and 12,000 passengers per hour in each direction. The total cost of works and approaches is taken at 340,000*l.*, and the working expenses at 4,000*l.* per annum, or more than double those contemplated by Mr. Duer.

We may remark here that it is difficult to ascertain, from a daily average of passengers, the proportionate number that require the use of a bridge at any hour of the day or of the night. This fact is a strong argument in favour of a fixed and always accessible bridge. The means of passage might be a matter of life and death, or at least of extreme urgency, to a few individuals in the course of the year at hours of the night at which it would hardly be expected that a costly hoist should be set in motion at the call of a single passenger. Yet the mere fact of the concentration of traffic on the selected spot would give to individual travellers a strong claim to instant attention at any moment. If we average the day at twelve hours, and consider that all the traffic of London Bridge is equally distributed through those twelve hours (which is a very rough approximation to fact), we find that 1,596 vehicles, and 8,696 foot-passengers cross every hour. Of these it is estimated that 30 per cent., or nearly 500 vehicles, and 2,600 passengers, would be diverted to the new eastern bridge. But we shall very much undervalue the service which the proposed communication is likely to render to the metropolis if we credit it only with the traffic which it may abstract from London Bridge. It would create, if placed at a suitable spot, a large traffic of its own,—a traffic that in all probability would soon equal that which it was at first calculated to divert. Then if we consider how traffic is concentrated at certain hours, we shall find that no engineer would be justified in undertaking a costly work of a permanent nature for the accommodation of the eastern traffic which should not be capable of transmitting a current of at least 800 vehicles, and 4,000 passengers per hour in each direction through the busy time of the day. This is far beyond the capacity of either of the proposed hydraulic-lift bridges, and is an additional indication of the fact that it will be wiser for the City of London to look to a permanent bridge, regularly approached, although it may have a million to pay for it, than to endeavour to save expense by any hitherto untried expedient. Indeed, if any other course is to be considered, we are disposed to advocate that of a regular steam-ferry, such as already is well known to work with considerable regularity in other parts of England. It is remarkable that no inventor has suggested a plan of the kind,—not a paddle-wheeled boat, but a platform working by chains across the river. The experience of the Gosport Bridge, and of that near Devonport, are here available for our guidance; and if saving of immediate cost be the first consideration, the committee would do well to collect full information on this score.

It is, however, not so much of importance to do what is cheapest as to do what is best. Contrary, we must confess, to our own anticipations, we find that our judgment inclines, on the evidence before us, neither to a subway nor to any complex mechanical means of crossing the river; but to a permanent bridge, at a high level, approached by well-formed roads. As an architectural monument, of course nothing can compare with this method of treatment. We desire to speak

with all reserve; it is possible that evidence will be forthcoming that may modify this view. But, as far as the matter has been brought before the world by the Special Bridge and Subway Committee, such do we take to be the outcome.

#### MR. PARKER'S NOTES ON THE COLOSSEUM.\*

"THE Flavian Amphitheatre, commonly called the Colosseum," forms the subject of No. VII. of Mr. J. H. Parker's volumes on the "Archæology of Rome." The first point, and much the most difficult, in digesting the contents of one of Mr. Parker's books, is to find out what it is that he really intends to tell us. Any connexion between the facts brought forward and theories founded on them, or between one fact and another as bearing on the theory, it is left for the reader to discover by a wearisome and puzzling process of putting two and two together; the particular fact on which the author's whole assumption mainly rests being sometimes found in some out-of-the-way corner of his book; at other times repeated in the self-same words in half a dozen places, but in a manner so apparently unconnected with any argument that it is only by observing the frequent repetitions of the same statement that we are led to conclude that the author attaches some special importance to it, and are put on a process of hunting out what this may be. This is perhaps a salutary means of making a reader think for himself; but it seems very unfair that the author should throw upon the reader all the burden of arranging the facts into something like order, and compel him to be reader and editor in one. We have endeavoured to fulfil the joint office according to our ability; and if our remarks are a little tinged by acerbity, Mr. Parker must take this as evidence that we have paid his book the compliment of studying it attentively, and have thereby arrived at that state of mental exasperation which is the inevitable result of such an exercise.

The gist of what Mr. Parker lays before his readers is this:—In the first place, the recent more thorough excavations in the arena have given quite a new aspect to this portion of the structure:—

"These were made under the ground, at the foot of the podium, which is the same as that of the original arena: this large level space has been indifferently called the ground, the floor, the stage, the arena, or the arena; no one had any idea that the original pavement would be found 21 ft. below that level, and that the intervening space was filled with walls and passages, dens for wild beasts, places for lifts to send up men, and dogs, and animals, and canals for water, and several other contrivances for the use of the performers on the stage above; for practically the arena was the stage on which the performances took place. These excavations have enabled us to ascertain that this had been a boarded floor covered with sand, or arena, whence its name, and that this floor could be moved and replaced in a short time, at the word of the emperor. The evidence of this is brought out clearly in the present work."

Mr. Parker further undertakes to explain in detail the methods of raising the "dogs and animals" from the subterranean dens to the arena, of letting in and out the water for naval spectacles, of removing and storing the boarding when not in use, and other details of the machinery of the spectacles, as he considers them to be, made manifest by the evidences to be found in the remains of the substructures.† Furthermore he propounds the theory that the amphitheatre is on an old site and mixed up with remains of former works of the same kind; that it was the site of the amphitheatre of Scaurus, described by Pliny, and by him characterised as an insane project; that the substructures of the arena are partially the remains (so we understand him) of this amphitheatre, considerably shaken by earthquakes and repaired in the time of Nero, and subsequently also; that this was, again, Nero's amphitheatre for shows and naval spectacles, and had probably brick galleries built around it, in the style of the period, for the spectators; that finally the great stone edifice of the Flavian emperors was built round the arena in place of Nero's galleries, the ancient substructures of the arena being still retained if

\* The Archæology of Rome. By John Henry Parker, C.B., &c., &c. Part VII. The Flavian Amphitheatre, commonly called the Colosseum. Oxford: James Parker & Co. London: John Murray.

† *Nic*: a dog not being, we suppose, an "animal" in the author's vocabulary.

‡ Mr. Parker accuses the French engineers who superintended the partial excavations of 1812, of not having seen that they had excavated the tops of arches, the lower parts of which were buried. How does he know they did not see it? There surely may have been other reasons for discontinuing the excavation besides the idea that everything possible had been accomplished.

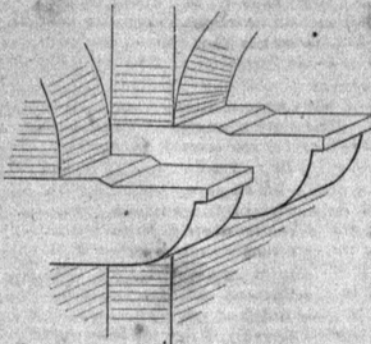


the centre of the new building and made to serve their original purpose, with modifications; that the upper story of this last structure was originally of wood, and was rebuilt of stone (after a fire caused by lightning) in the reigns of Alexander Severus and Gordianus; and that of this rebuilding evidence is left by the existence of piers of hard travertine stone carried up from the basement, through the softer tufa and brick walls, to assist in carrying the weight of the stone upper story; the manner in which these piers cut through the rest of the walling showing, says the author, that they were subsequent insertions apart from the general building of the structure.

The first phase in the historical portion of this scheme is a curious illustration of Mr. Parker's habit of assuming a theory and then twisting everything into a proof of it. He twists other archaeologists with accepting the phrase, "it must have been thus," as a proof of a thing; but this and other parts of his own work are nothing but the employment of the argument of "must have been" on a most extensive scale. Scaurus was accused of insane extravagance in building a theatre which held 80,000 people; Mr. Parker cannot imagine any other possible site for this in Rome, therefore it "must have been" here. The theatre of Scaurus (which is called "theatrum," and not "amphi-theatrum") is cited by Pliny as an instance of a private man having outdone in size every other theatre, at his own expense. "Hic fecit in sedilitate sua opus maximum omnium, quæ unquam fuerit humana manu facta, non temporaria mora, verum etiam æternitatis destinatione." This, says Mr. Parker, in a note, "seems to mean that the upper part was temporary, but the sub-structures were permanent or eternal"; and this is how he gets the origin of the sub-structures of the present Colosseum. The context of the passage, which seems to contrast this theatre of Scaurus with the permanent structures of other builders, would suggest a different reading; and in Mr. Parker's own appendix, in which the translation of the passage is given at length, he forgets his argument, and translates it,—"during his ædileship, and only for the temporary purposes of a few days, Scaurus executed the greatest work that has ever been made by the hands of man, even when intended to be of everlasting duration." Then follow the words "Scena ei triplex in altitudine," which Mr. Parker translates to mean that the building was in three stories, like the Colosseum, though he admits that *scena* always means the stage (or more correctly, perhaps, the proscenium), and the lower part of the *scena* is said to have been of marble, the middle of glass, and the upper of gilt wood. We can scarcely imagine the middle gallery for spectators being of glass; but the whole is quite intelligible if we apply it to the decoration of the proscenium. The *cavea*, Pliny says, held 80,000; and if we regard it as a theatre, the *cavea* would be the hollow curve of the auditorium, distinguished from the *scena* or stage portion. But Mr. Parker takes the *cavea* to be the amphitheatre seats, and jumps at the similarity of numbers, as the Colosseum itself held 87,000 spectators. Here the *scena* and *cavea*, evidently contrasted in the original, are made by the author to be the same part. But in the description of the existing Colosseum he twice cites a passage from Prudentius, to prove that the *cavea* meant the hollow portion in the centre under the arena, where the dens and the stage machinery were. At that particular part of the book it suits him that *cavea* should have that meaning. After this, Mr. Parker had better drop the amphitheatre of Scaurus. It might have done as a passing suggestion; but to find an author dogmatizing, in the positive way in which Mr. Parker always does dogmatise, upon the basis of such an utter confusion of ideas and arguments as this, is really too ludicrous.

It is otherwise in regard to the second stage in the historical analysis, the separate construction of the Flavian Amphitheatre around previously built substructure walls in the centre. Taking the fact that, within the basement wall of the stone structure (beneath the arena level), there runs an arched tufa-wall very close to it, but nowhere bonded with it, and that the piers of the inner wall do not correspond with those in the outer wall, the conclusion that the two were not built at the same time seems irresistible; and the probability is that the inner and less important and costly wall, which has no connexion with the outer structure, existed first, as, if it had been built later, it would be so

easy to make its piers coincide with those of the outer wall. This is, to our mind, the chief argument in favour of the theory: Mr. Parker lays great stress upon the existence of arches, in parts of the substructure, turned with the long Neronian bricks (3 ft. or 4 ft. in length); but this fact alone might hardly be inconsistent with the reconstruction of the whole when the external design was carried out, merely supposing some old bricks that were on the spot to have been used up again. Another point drawn attention to by Mr. Parker, in support of the previous existence of the tufa walls under the arena, is, in fact, if anything, directly against such a supposition. On each pier of the outer wall (on its inner side) are a couple of projecting corbels, with a deep groove between them, which is evidently intended for the support and fixing of the masts carrying the inner edge of the velarium.



Immediately in front of these corbels comes the tufa wall; Mr. Parker says (notes to Plate xviii.) they are "built into" it, but his section in the plate shows them merely touching it; but either way, it seems a most unlikely thing that corbels should be moulded at the end, as shown, when they were to be hidden by an existing wall in front of their position. This is an instance of the way in which Mr. Parker, even when he adopts a probably right conclusion, brings in support of it facts which, if he rightly realised the processes or conditions of building, he would see were adverse to it. Similarly, in regard to his theory of the subsequent introduction of the hard travertine piers, before referred to, for supporting the upper gallery, he is possibly correct in his supposition; but his Plate xxi, showing where a travertine pier has been removed from between two relieving arches in the brick wall, without disturbing them, does not the least prove that the whole was not built up at once: he might find numberless instances, in ruined structures, of relieving arches that are held up in the masonry above and below them, while their theoretical points of support, or abutments, are gone.

Mr. Parker's description of what may be called the stage machinery of the Colosseum is in some points interesting and somewhat ingenious; but he shows his usual tendency to be too positive about the truth of every idea he has entertained, and it is evident that in his imaginary descriptions he often quite fails to realise how things would actually operate. The substructure of the arena is divided longitudinally by very strong and thick walls into five long openings or canals, of which the centre one, he considers, was a dry dock, and the four side ones huge canals or troughs of water for the naval spectacles, the two inner canals carried on beams and on a thickening of the wall below them, and the two outer ones on brick groining. In conjunction with the photographs, we may, perhaps, accept this as a not impossible explanation of this part of the structure. But then he tells us (and he takes it as absolutely proved) that the flooring-boards, when removed from the arena on such occasions, were tumbled down in the narrow space round the edge between the stone wall and older (?) tufa wall before mentioned, and rested on the pairs of corbels which we have sketched above, and which, he thinks, were prepared for the reception of the boards, on account of the sinking on their upper face. How that would make them any better fitted for the purpose, or why the flooring-boards should be pitched into a crevice several feet deep between two walls, from which it would be most troublesome to fish them out again, it is impossible to say; and we may here ob-

\* We must refer the reader who cares to go into the question to Plate xviii. of the book.

serve that this idea of the loose flooring-boards does not appear to rest on one iota of authority, and is merely evolved from the depths of Mr. Parker's inner consciousness. But has not Mr. Parker logic enough to see that if these corbels always occur in pairs on each side of the groove for the masts, and nowhere else, they must be connected with some arrangement at that special point? To our thinking, the object of the double corbels and the sinking on their face would seem to be to aid in the fixing of a crosspiece to steady the masts, which were footed on a template at the bottom of the groove a few feet lower down, and were secured from movement inwards at the level of the double corbels. As to the loose boards, if such an awkward arrangement really existed, naturally they would go into the dry dock in the centre. Mr. Parker wants to keep the galleys there, till required for action, because he found at the bottom of the "dock" the remains of a timber frame like what he is told are used in graving-docks for the ships to rest on. And how in that case were the galleys to be got into the canals at the side when wanted? Hoisted up, we suppose, with a system of sheers and tackle, and swung over into the canals? Why, if (as Mr. Parker supposes) there was a system for letting water into and out of the canals when required, of course the galleys would be kept in them when dry, and would float up with the water when it was let in; nothing simpler. In his description of the machinery for hoisting the animals up to the arena level he is also more imaginative than practical. The vertical grooves seen in the walls were probably for lifts to work in, and the larger grooves very possibly, as he suggests, for counterweights. Certain round holes in the floor he will have are sockets for windlasses to wind up the cages. If these sockets were found before each den, this might be an obvious theory; but by his own showing on the plan (Plate viii.) they are not, and they occur in other places apart from the neighbourhood of the arena; and his own view of the *modus operandi* (Plate xvi.) shows that there could be no convenient room for working capstans with horizontal bars, nor could they be necessary, if we are to suppose the existence of counterweights. The author, by the way, describes the cages (*pegmata*) as of wood, but he shows them as iron; but the whole account of this part of the operation is confused, and the working of the machinery, as he indicates it (Plate xvi.), most awkward and improbable.

The illustrations, including comparative plans of some other amphitheatres, are of real interest, and, being mostly photographs, can be depended upon. As to style, when we complained, in noticing the last number of the series, of the confusion and needless repetitions of the book, Mr. Parker wrote saying that we could not know the difficulties under which he laboured in bringing it out. Whether he is haunted by difficulties that other authors are exempt from we know not; but his difficulties seem to us to arise from a want of literary perception and of common care in editing. As a specimen of Mr. Parker's "vain repetitions," we subjoin the following:—

Page v. of Preface.—"These sockets, of which there are a great number in the pavement, are evidently made for a pivot to work in each; and these pivots must have been the lower end of a post for a capstan, to wind the 21 ft. of cord upon when the animal in his cage was pulled up to the top, and the trap-door opened by the same cord from below," &c.

Page 35.—"Where the cage on the lift was pulled up to the level of the floor of the arena, under one of the trap-doors, the upper part was pulled up by a cord from below. . . . In the original pavement is a round hole for the socket of a pivot to work in, evidently for the windlass for winding up the cord."

Notes to Plate vi.—"In the passage is a long series of sockets seen in the pavement, apparently each for a capstan to wind the 21 ft. of cord upon, when the cage was pulled up to the top, and the traps opened."

Notes to Plate xviii.—"Behind the place for each cage in the paved floor of the passage, is a socket for a pivot to work in, at the foot of a capstan and post, to wind the 21 ft. of cord upon, with the lift, when pulled up to the trap-door," &c.

Is it any wonder that the reader loses his temper at having this utterly imaginary "21 ft. of cord" dangled before him in this foolish fashion? This is only a specimen: how many times we are told that the "area was covered with loose boards and strewed with sand and thence called *arena*" we should be afraid to count; it is a complete puzzle to make out whether one has read any particular page before or not; and as to anything like a regular and consecutive carrying on of the argument, that seems out of the question. We repeat that a Mr. Parker cannot arrange his matter into if decently readable form, he should secure the assistance of a friend with some literary ability



to get his books into shape for him. We have taken the trouble to get at his meaning, knowing that he has information to give; but no author has a right to worry his readers by putting forth books in such a state of jumble and confusion.

Since the above remarks were put into type, we have had opportunity of examining the beautiful set of drawings of the Colosseum made for the French Government in 1812, which are referred to by Mr. Parker. They were purchased for the British Museum not very long since, and are in the Manuscript Room there. They consist of a number of large drawings or mounted tracings, showing (geometrically) every portion of the building as far as excavated at the period, in its actual state, and with carefully-drawn restorations based upon the remains. The drawings of the actual state of the building are evidently made with the most minute regard to accuracy; all the different materials are carefully distinguished by colouring, and full explanations appended in small but beautifully-neat manuscript.

As we anticipated, the drawings at once contradict the supposition of Mr. Parker, that a set of French engineers could have been capable of excavating the upper part of a series of arches without seeing that there must be something more below, whilst they furnish further proof of the hasty character of some of his assertions, and show that if he really examined the French drawings he has done so without taking any trouble to understand them. In the face of these drawings, the statement on the first page of his preface, that before the excavations of 1874 no one had any idea as to the real depth of the central area, or the existence of walls and dens under the apparent ground level, is simply ridiculous. The French engineers' restorations on the drawings numbered 4 and 5 in the collection, made sixty years ago, show not only that they had a perfectly distinct perception on this point, but that their conjectural restoration comes very near the actual depth found in excavating; they give a depth of nearly 20 ft. from the base of the podium to the floor of the substructures, the discovered depth being 21 ft. (the length of Mr. Parker's "cord"). Now as to the double corbels noted above: in the French drawings they are shown with the sinking on the surface square in section, and coincident with the plane of the wall, and not advanced from it; and as Mr. Parker's photographs show these corbels to be very dilapidated and knocked out of shape, quite sufficiently to leave room for conjecture, we are much disposed to accept the French engineers' restoration. Well, now we come to an important point. We noticed above that the fact of these corbels being moulded ornamentally and yet shut out of sight by the interior tufa wall built almost against them, in itself would go to prove that the inner wall was later, and had been built up in front of them afterwards. We find, from the notes on the French drawings, that their authors adopt as a matter of course the opinion that these corbels must have been meant to be visible when built, and that the substructure walls have been altered afterwards. In the notes on Sheet 1 of the drawings they say that, "judging by the nature of the materials and of the work, all these constructions must have been greatly altered since the origin of the amphitheatre, and we can easily see the numerous repairs which have been rendered necessary by earthquakes." Mr. Parker falls back upon his knowledge of the bricks of different epochs (which we do not care to contest), to show that parts of these structures are earlier than the exterior; but of course mere sleeper walls in a subterranean construction are exactly the portions in which old materials are likely to be used up again, and there is the fact that the French theory explains the position of the corbels, and Mr. Parker's does not. The theory of the French engineers is that at the time when the sea-fights or *naumachia* were the most popular entertainments, the stage had a permanent floor some little distance below these corbels, and that the said corbels carried the springers of the stone *revêtements* of the arches between them (which now show brick only), and that through these arches the water was poured in cataracts to fill the arena for the *naumachia*, and that the small vertical shafts which Mr. Parker calls feeding passages for the dens (but which do not reach nearly to the floor of the dens) were sluices to let in the water. Afterwards, when chases and combats became more popular than naval fights, the floor or pit was found too low,

and was raised to the level indicated by the sub-structure walls as they now remain, and a movable wooden floor provided. Any one looking at the restored sketch of the first arrangement, in Sheet 27 of the French drawings, will at once see, at all events, what a far finer naval spectacle could be ensured in this way than by Mr. Parker's idea of the limited tanks in the middle of the arena, where the triremes could only, in fact, move in one straight line. The dens for the animals would be in the subterranean story below this permanent floor, with inclined passages and trap-doors which could be made water-tight when the arena was flooded. Evidences of this very arrangement of a permanent floor and trap-doors are brought forward by Mr. Parker himself, in the case of the amphitheatre at Pozzuoli, of which he gives illustrations. This theory gives also an explanation of the double row of arches seen in Mr. Parker's Plate xviii., the flat arches below carrying the sills of the semicircular arches above them, over which sills the water was supposed to flow into the arena. The mere admission of the water in this way would in itself have been a fine spectacle; whereas we can hardly imagine anything more paltry than the *naumachia*, as conceived by Mr. Parker, taking place in two isolated parts in the middle of the arena, of most awkward shape, and of which only part of the surface (over the two canals) was really deep enough for galleys to move in, the rest being covered with shallow water for appearance only! We may depend upon it, the Romans did the thing better than that, if they did it at all. The French scheme, also, throws open (whether for the *naumachia* or the land combats) the whole area within the walls; while Mr. Parker, for some reason that we have in vain endeavoured to realise, imagines an inner barrier or railing, contracting very seriously the available area of the arena, and leaving a space between it and the walls all round which is entirely wasted. As evidence in favour of this he gives a photograph (Plate xxiii.), of a rude sketch scratched on a stone found in the recent excavations, showing what appears to be a kind of open railing with cross braces, and below this a series of semicircular arches with flat sills, and below that again rude figures engaged in some sort of performance. Mr. Parker takes this as evidence in his favour; the railings represent the barrier between the people and the arena, and the rough arches, with some sort of grill fitted into them, the dens of the animals; quite forgetting that these latter could not be seen from the arena, on his own showing, since they would be below the floor level. But turn to sheet twenty-seven of the French drawings, which shows their idea of the arrangement before the floor was raised, and there we have, in their restoration, the actual thing which is (rudely and out of proportion) shown in Mr. Parker's photograph: the railing above and the row of semicircular arches below with flat sills at the springing. We do not lay much stress on so rough a fragment; but there is the fact, that what it shows can be reconciled with none of Mr. Parker's restoration, but is completely in keeping with what is shown in one of the French restoration drawings, and might, in fact, pass for a rude memorandum of it.

Looking, again, at sheets two and three of the French drawings, representing in coloured geometrical drawings the actual state of the sub-structure walls as far as then excavated, we see a good many series of square holes in an oblique line in the walls. No one who examines these drawings can doubt their substantial accuracy; and these oblique rows of holes, which Mr. Parker avoids mentioning at all, can only be explained as the seating for bearers for inclined planes. The explanation of these by the French engineers, that they were the inclined planes furnishing the passage for the animals from the dens to the arena, seems the only one possible; and it is certainly more reasonable to suppose that the animals should have run up in this way, than that hundreds of men should have been employed to wind them up to the proper level by such clumsy expedients as those which are attempted to be indicated in Mr. Parker's Plate xvi. The vertical grooves in the walls are easily explained, as necessary for winding up stage erections and decorations for scenic effects, which could not raise themselves.

We are by no means necessarily accepting the restoration of the French engineers; but any one studying their full and elaborate notes and drawings cannot fail to be struck with the consistent and logical method in which their

theory is stated, and the clear perception it evinces of the actual working of the operations which they suggest. It cannot be necessary that we should apologise for criticising Mr. Parker in plain language, for no writer has shown more of the odium *archæologicum*, none has been more ready to use the strongest and most unkind language in regard to every one who was unfortunate enough to question his views, than Mr. Parker himself; and he is so confident in stating his own opinions, and so contemptuous in dealing with those of every one else, that many who have not the time or the means to investigate the grounds of his opinions may not unnaturally suppose that there must be very unanswerable reasons for such positive and dogmatic statements. We must repeat our opinion that Mr. Parker has done good service to archaeology by collecting a great number of facts, for which let him have all credit; but that his deductions from his facts are often utterly illogical and untrustworthy, because when he has once formed a theory he either will not or cannot see anything that contradicts it; he forgets in one place what he has said in another; and, whatever his merely archaeological knowledge of ancient materials, he obviously has not a sufficiently clear perception of the actual process of architectural design and construction to realise the working of his own suggestions, or the practical contradictions involved in them.

#### "ST. PETER'S AND ST. PAUL'S."

ALTHOUGH the scheme for decorating the metropolitan cathedral is at present in abeyance, and will probably hardly be revived in the form which it last took, the solid sum of over 40,000*l.* has been subscribed and is in hand, and is bound to be applied, sooner or later, in furtherance of the object for which it was advanced. With the view of smoothing the way for carrying on the work,—so far, at least, as the funds in hand will go,—Mr. Oldfield, a member of the Executive Committee for the decoration scheme, has availed himself of the opportunity of a short tour in Italy to note the characteristics in the decoration of the churches which most resemble St. Paul's in style, and frame from these observations some conclusions as to the best methods of carrying out the work in our own cathedral, which he has embodied in a letter addressed to the Dean of St. Paul's,\* and forming a small volume of between 90 and 100 pages. All suggestions on a subject on which it is so difficult to arrive at any satisfactory conclusion must be received with due caution; but we may at once say that Mr. Oldfield's remarks are worth the perusal of all who are interested in the matter, not only for their good sense and moderation, but for the unusually correct and refined ideas in regard to the æsthetics of decoration of which they afford evidence. The author, we imagine, has been in a minority on his committee; for had such counsels as those which he gives been in the ascendant, some propositions which we have had to review would never have been made.

On his way to Rome, or at least before arriving there, Mr. Oldfield takes Florence, Genoa, and Milan. The Capella dei Medici at Florence suggests the consideration that permanent polychromy, formed by applying to the walls veneers of thin marble, though a legitimate decoration, is only suitable where the architectural forms are simple. "Where the building is at all complex, large marble mosaics are liable to perplex the eye and confound substance with surface." Under which head the author considers St. Paul's to come he does not here say; but he subjoins in a note his protest against the idea of cutting away solid ashlar masonry to build in white and coloured marble coatings,—a system, as he observes, "not to be found in Italy." An observation as to the bronze-gilt statues in the chapel is very significant in regard to the subject in hand. The chapel decorations in general are in so high a key, that plain bronze, or even marble, would have seemed mean. Let us not, he says, overlook the lesson. "There is little likelihood that St. Paul's would ever be inlaid with the gorgeous substances of the Capella dei Medici, as this would require many millions of our money; but it is not beyond conception that some less costly but hardly less ostentatious method of embellishment might be attempted, which would seriously impair what

\* St. Peter's and St. Paul's: Notes on the Decorations of a few Churches in Italy, including St. Peter's on the Vatican at Rome; with Suggestions for Proceeding with the Completion of St. Paul's; in a Letter to the Venerable R. W. Church, D.C.L., Dean of St. Paul's. By Edmund Oldfield, M.A., F.S.A. London: Longmans.



in many of our monumental sculptures is the only merit, the decorative effect of their marble." We call attention to this because, in the most prominent of the schemes for decorating St. Paul's, the consideration of the part which the large number of monumental works now in existence there would claim in the total design seems to have been quite overlooked. In passing through Milan, Mr. Oldfield notes S. Vittore al Corpo as an instance of a church which, without presenting anything of the highest rank of art when taken in detail, has a most satisfactory total effect, from the completeness and balance of the whole decorative scheme. As to the general deductions which he evidently wishes us to draw from this consideration we have a word to say just now. But the following suggestions in detail are sufficiently well put to bear quotation (page 29):—

"Without presuming to prescribe any design for the future ornamentation of St. Paul's, it may be permitted me to call marked attention to two of the details here described": 1. To the gilding of the fillets between the flutings of the shafts of the principal order. Assuming that gold will be more largely applied in the upper part of the building, this would serve to carry down the enrichments in a moderate and refined form to the level of the eye; whilst it would have in St. Paul's a special recommendation not applicable at St. Vittore, that it would leave the stone fabric of the shafts themselves uncovered and undisguised. 2. To the monochrome panels with bas-reliefs on the lateral faces of the nave piers, which are obviously imitated from the beautiful work of Giovanni da Udine, in the Vatican. These suggest a treatment for the panels which Wren has so largely introduced in nearly similar positions, and which seem intended expressly for decoration. If the pier itself is left to display a substance of Portland stone (as may be at least assumed for argument's sake), this stone would hardly combine agreeably with marble, porcelain, glass mosaic, or any very rich and polished surface in the panels. But white stucco figures, in very low relief upon a flat tinted ground, would be quiet and harmonious in effect. Stucco is a material which Wren himself has freely used for ornamental reliefs; and the proposed application of it belongs strictly to the most approved period, having been adopted alike by Raffaele at the beginning, and by Alessi towards the end, of the sixteenth century."

The bulk of the treatise is devoted, as its title implies, to a consideration of the decorative scheme of St. Peter's in detail. One or two only of the considerations on this part of the subject we can specially notice. The author adds his assistance towards dispelling the ridiculous popular notion about the "proportions" of St. Peter's and their effect on the apparent size of the building,—a notion which, we begin to hope, may be hunted down in time. In reference to designs which have been before now proposed for the apse of St. Paul's, Mr. Oldfield observes that nowhere in any Cinquecentist church has he seen the isolated form of the Saviour in glory in the centre, surrounded by isolated forms of saints or angels in lateral compartments; and whatever the solemn grandeur of the large figures which look down from behind the altar, in the early Christian basilicas, the introduction of such a figure into the apse of a building erected by Wren would be a solecism. We are glad to find one member of the committee, at least, who perceives this. In the *Builder* for May 16th, 1874, Mr. Oldfield will find (perhaps has found) our own still stronger condemnation of the suggestion, for reasons relating to scale and effect, as well as to the question of anachronism. The satisfactory effect of the large piers of the nave, in spite of their comparative meanness of material, is touched upon:—"all is coated with stucco, painted to resemble a greyish-white marble, slightly veined; whilst the real marble of the statues in the niches has nearly the same hue. Thus the whole looks uniform, broad, and quiet, . . . whilst a busy polychromy would have distracted the eye from taking in the breadth of the architectural construction." There is a great deal of truth in this; though in regard to the abstract question of structural polychromy, it may be said that it would need a tolerably "busy" polychromy to look at all too prominent or marked in the light by which the interior of St. Paul's is seen in most days in the year. The question of constructing such a polychromy now, after the building has been long completed, is, of course, another thing entirely.

Much of the St. Peter's decoration our critic considers, and with good reason, to be vulgar and objectionable. But on the decoration of the dome he bestows nearly unqualified praise, as far as regards its decorative effect. This satisfactory result, he urges, can lie neither in the size of the dome, which is equalled by that of Florence, nor in the superior excellence of Gesari's figures—in themselves, since they are, from a painter's point of view, far inferior to other works by greater masters in a similar position, and which are universally regarded as failures in point of effect. For the grand effect

of St. Peter's dome we must look to the fact that the figure subjects are arranged in subordination to an architectural framework conveying the idea of constructional expression, and that they are kept entirely flat, and with none of that attempt to give them a vanishing perspective, the result of which often is that the nearest part to the eye is the sole of a foot, or, when the figures are seated on clouds, "something even less interesting." There is no occasion, however, to insist on the mistake of such attempts at pictorial fore-shortening in decorative painting of this kind. The one thing in regard to which, at least, there seems now to be entire unanimity among our artists, is that decorative wall-painting should be flat and in one plane. The further conclusions suggested are, that nothing can be more effective for a dome than "an overhanging array of simple, solemn figures"; that the number of these should be sufficient to give an idea of great space, and the scale, though large enough to secure distinctness, yet small enough not to diminish by comparison the size of the vault,† or bring the upper and lower parts of the same figure at perceptibly different angles to the eye: to design the figures with severe statuesque simplicity, but not with archaic conventionality (the italics are our own); and to adopt the system of gold backgrounds, which keeps the whole flat and diminishes the absorption of light.

And now as to Mr. Oldfield's "practical conclusion" in reference to the business in hand—the profitable employment of the funds already subscribed for the "completion" of St. Paul's (the author places the word "completion" between commas when he makes use of it, by which we conclude that he perceives the expression to be, as it really is, a begging of the question). The suggestion is that, the money should be employed in decorating the dome with mosaic by way of making an impressive and striking commencement of the decoration in the part of the building and in the material concerning which alone there is any definite record of Wren's wishes; which is the architectural centre,—and, in consideration of the interest recently attaching to the dome services, may almost be said to have become, in the eyes of the people at large, the ritual centre of the building. The work should be regarded as purely a painter's work, and three or four artists who are known to have capacity and more or less experience in decorative work on a large scale should be invited to submit designs; all to be remunerated for their labour, and the one whose design is approved to carry out the work.

There is much in this suggestion that may seem to recommend it, but we doubt whether it would really be wise to sink all the funds that are in hand at once in decorating the dome. It must be supposed that one object in doing this is to present something which would arouse public interest, and give an impetus to the carrying on of the work. But look up at the dome on any day of not extraordinary brightness, and it must be apparent that decoration applied there, and there alone, will hardly strike any one very much, or be very effective: there is not light enough, and it is too far from the eye; and, as the author himself observes, figures at such a height immediately overhead, are always seen "with great difficulty and discomfort." As a part of a great scheme of decoration, to which the rest of the work would lead the eye up, it would be better estimated; but as standing alone, we very much question the prudence of putting all the available money into it. We should rather suggest the decoration of the chancel completely, and the carrying of the decoration, or its main features, as far along the choir as present funds will allow. Whatever is there done can be seen and appreciated, and will go further in effect than anything done at such a height as the dome. As to making it an artist's rather than an architect's work, there we are quite with Mr. Oldfield; that, we are disposed to think, is what should have been done at first.

\* In regard to the actual construction of St. Peter's dome, we may observe that Mr. Oldfield does not quite appreciate the force of Wightwick's criticism on the "chains of iron," against which he protests in a note. The fact that Wren introduced a chain in his dome, "to make assurance doubly sure," does not place the two domes on the same constructional footing. Wren's dome would, in all probability, be safe without the chain; St. Peter's, on the lines and on the scale on which it is built,† inevitably would not, and is an unsound and unstable construction.

† In regard to this point we cannot but observe that the mosaic figures already in two of the spandrels under the dome of St. Paul's seem too large, and tend to reduce the scale.

One word, before we dismiss the subject, as to an idea which very much pervades the author's suggestions; namely, that a generally well-balanced and well-considered decorative effect is more to be aimed at than any remarkable display of pictorial genius in any one portion of the work. Due subordination and arrangement of the general scheme is absolutely necessary, certainly; but there is another side to the matter, and we can hardly say that a well-balanced decorative effect is the highest thing to be arrived at, when once the question of pictorial decoration is admitted at all. Whatever may be said, and with truth, as to the want of architectural or decorative fitness for their position in some of the great Italian works in mural (under which term we include ceiling) painting, let it be remembered that, in spite of this, it is to these that all the world crowds in admiration, and these have made the names of their inventors great in all lands. By all means, aim at decorative fitness, at a true mural style, at coincidence with the architectural design and construction of the building; but a decorative scheme which displays all this will hardly be an adequate return for the sum that must be expended upon it, unless to these qualities be added something of the light and glory which only genius, speaking through the highest and grandest form of pictorial art, can shed over the whole. If the decoration of St. Paul's can evolve and develop this, it will be worth anything that may be spent upon it; but hardly otherwise.

We must, however, compliment Mr. Oldfield on a contribution to the literature of the subject which is marked by no little thought, taste, and judgment, and which deserves the most respectful consideration.

#### NEW WORKS IN EDINBURGH.

THE year now drawing to a close shows no decrease in building enterprise in this city, although it has been marked by the completion of only one building of much architectural importance,—the Union Bank offices, in George-street. Several works of minor importance, however, have been brought to a successful issue, and a considerable number, more or less important, are in progress and in contemplation.

The first step taken by the Edinburgh School Board, in order to procure suitable plans, was to institute a limited competition, giving as a test two sites differing materially in their nature: one at Leith-walk, which, being entirely isolated, and having ample space at command, gave free scope to the architect; the other, at Fountain-bridge, situated in a narrow street, and closed in on each side by adjoining buildings, and, therefore, a more difficult one to grapple with. Schools have now been erected on both these sites, and they are each remarkably good examples of their class, and will bear comparison with any others in the kingdom.

As regards school accommodation and endowment, Edinburgh stands in an exceptionally favourable position, owing to the numerous benefactions left for these purposes. The call upon the ratepayers was consequently small compared with that in other cities, being at the rate of 1½d. per pound, and with this rate the Board were in a position to be liberal as to the nature of the accommodation to be provided. It was, therefore, resolved that the schools should not be kept down to the bare requirements; the Government requirement of 8 square feet for each scholar was raised to 10 square feet, and it was considered that the buildings should possess some degree of elegance so as to be a means of educating the taste of the pupils. This has been done at a cost of 18½. 11s. per head, which is, we believe, at a higher percentage of expenditure than elsewhere. The Fountainbridge School, designed by Mr. R. Anderson, is in a style of Gothic characterised by dignified simplicity; there is nothing in the slightest degree redundant about it; the details are simple, but every feature and accessory is of the most substantial description. It consists of a centre block of three stories thrown back from the street line, with advanced wings, having square towers at the re-entering angles. In these towers are ample staircases affording separate entrances for the boys and girls, and the wings contain cloak-rooms and retiring-rooms for the teachers. On each floor there is a large hall, a portion of which is screened off by a glass partition so as to form a small class-room under the eye of the master. The light is ample and the ceilings high, those of the two lower halls



showing the main beams which support the roof above, resting on stone corbels, and the ceiling of the upper one is open timber boarded. At the rear are separate asphalted playgrounds, with the necessary offices and covered sheds for shelter in wet weather. The building tells its purpose effectually, and its height and the substantiality of construction give it the character of a public building. It is intended to accommodate 750 scholars, but at present that number is exceeded pending the erection of another school at Dalry in the immediate neighbourhood.

In the Leith Walk School, designed by Messrs. Moffat & Aitken, similar accommodation is provided, but in two stories only. The style is also Gothic, but not quite so reserved in manner as that of the Fountainbridge School.

Other Board schools of the same description are in progress at Stockbridge, Marshall-street, and Caneswayside, and others are arranged for.

A large new school in connexion with Heriot's Trust has been erected in Davie-street, but it is neither so perfect in its arrangements, nor so good in an architectural point of view, as the Board schools. The style is a pretentious travesty of that of the parent institution.

The new fruit and vegetable market, at the site at the east end of the valley of Princes-street, formerly occupied by the Northern Railway Station, is now in use. It is constructed of iron and glass, with a flat roof upon the level of Princes-street, which is to be used as a promenade. This roof is pierced at intervals with lights, which are to be surrounded by flower borders. The accommodation is in excess of the ordinary requirements, and the area is, upon occasions, to be used for flower and other shows. The usual "Christmas show" of cattle and poultry has been held in this market.

The new fish-market is a stone structure, on the rising ground between Market-street and Cockburn-street. To afford access to the higher level a staircase has been formed, which is covered by an arcade, formed of massive Gothic columns, with moulded caps, spanned by arches slightly pointed. Part of the market building projects over this arcade, which forms a very picturesque feature. Both markets have been carried out by Mr. R. Morham, the city superintendent.

A "wonderful lamp," which from its magnitude and style (said to be *Norman Gothic*), and the conspicuous position it occupies in juxtaposition to the Scott Monument, cannot be overlooked, challenges attention. It is really a strange conglomeration of convoluted ironwork. To whom the merit of this rare specimen of art is due we are unable to state, the honour is said to be contested by sundry persons, and it would be invidious to prefer any one of them.

Building operations at the cathedral progress slowly and steadily. The arches of the nave and choir have been set, and the centering for the transept arches is in place. It is proposed to complete the nave first and board it off from the transepts so that it may be used while the central tower is in course of erection, an operation which will, necessarily, take a considerable time.

The nave of All Saints', Morningside, has been used for some time, and the tower and chancel are in progress. A beginning has been made to the proposed group of Free Church buildings at Mayfield. The hall, calculated to accommodate upwards of 200 persons, is in use as a provisional church. Outwardly it presents the features of a small church having a miniature narthex projected at the west, above which appears a disproportionately large circular window filled with tracery very much cusped. There are no windows at the sides, but there are two at the east end. The light, however, is sufficient for the small interior, and the building is suitable for the purpose for which it is erected, but it is decidedly perky in character. Mr. R. J. Blane is the architect.

A Free Church of considerable importance, and which is to cost about 10,000*l.*, is in progress in Chambers-street, opposite the Museum of Science and Art. It is designed by Mr. R. Thoratou Shiells, in the Lombardic style. A massive recessed doorway just now appears above the hoarding; it will greatly depend for its success upon the treatment of the detail, as the form has been prescribed by the City Improvement Trust so that it may be in conformity with the other buildings in the street, which are of a commercial character. We observe that there are still some sites in this street undisposed of; the parts already constructed combine unity of style with variety of outline and grouping, and

the single departure as to style in the church will, we conceive, give piquancy to the remainder. Mr. Shiells is also architect for a new Baptist church which is springing up in Marshall-street, another of the new thoroughfares projected by the Improvement Trust; it, too, is Lombardic in style, the architect apparently being of opinion that that style is more suitable for a Dissenting church than Gothic.

At Fountainbridge a new church in connexion with the Evangelical Union is progressing, from the designs of Mr. Hay, of Liverpool; it is Gothic in style, simple, and severe in detail.

The extension of the city calls for the formation of new ecclesiastical districts, and three new Established churches are contemplated at Liberton-road, Gilmore-place, and Dalry respectively; and a new Free church is projected at the latter suburb, and a United Presbyterian church at Meadow-place.

The last of the works comprised under the City Improvement scheme has been commenced. It consists of the formation of a new thoroughfare connecting Grindly-street with Lauriston-place, crossing the West Port and skirting the Cattle-market. This market has long been a nuisance in the heart of the city; it is proposed to supersede it by the formation of another in a more suitable position, and sundry of the suburban residents to the westward have taken alarm lest it should be set down in their vicinity, but at the last meeting of the Town Council it was announced that no decisive steps had been taken as to securing a new site.

A project has been set on foot for the formation of a new bridge at Belmont, to the west of the Water of Leith village. The present bridge is narrow, and consists of one arch, the approaches to which are by downward gradients. It is proposed that the new bridge shall consist of three arches, at a level of 40 ft. above the present one, and that the approaches be widened and levelled up. This improvement will give greater facility of access to a district where there are many beautiful building sites, some of which are, indeed, already occupied by new buildings.

The West-end Theatre appears to have been conceived on too great a scale to be successful in a monetary point of view. The original design has been greatly modified, the towers have been entirely dispensed with, and the statues, which were to adorn the parapet, have been superseded by vases of not the most elegant design. The wings, which were to contain an aquarium, winter garden, skating-rink, &c., are still in the womb of the future, and the bare brick flanks exposed to view are not attractive.

The West Princes-street Gardens have now been acquired by the city, and are thrown open to the public. It is proposed to carry out several important improvements in connexion therewith. The formation of tramways along Princes-street has been found detrimental to the general traffic, and it is intended to widen the street along its whole length by taking a strip of about 12 ft. in breadth from the gardens, removing the north line of rails to the south of the existing south line, thus giving a greater breadth of carriage-way in front of the single row of buildings which forms a terrace rather than a street. To the west of the gardens there is a deep-cut roadway leading from the Lothian-road to the Grassmarket. This road it is suggested, might be shut up, and another substituted along the southern slope of the Castle-hill. By this means the garden ground in front of Castle-terrace could be added to the public garden, and a walk formed from Cornwall-street to the Royal Institution, which would greatly facilitate foot passengers in that direction.

We have repeatedly adverted to the spiritless monotony of the new streets and terraces at the West End. There is no improvement in this direction; a new terrace, facing the north, called Douglas's-terrace, is springing up; the elevation is a repetition of the uninteresting yet pretentious one of the adjoining Magdala-terrace, consisting of an unvarying recurrence of oriels, identical in form and detail. There is here an utter negation of art which is painful to witness; it would cost no more to builders were the designs somewhat varied; it is not expensive detail that is wanted, but grouping and gracefulness of outline. This is one of the evils of having one architect to design all the buildings upon an extensive property. The slightest trouble in providing new elevations is often shirked; the affair is a mere matter of so much per centage,

and the result such as we have described. The work carried out by the architects of the City Improvement Trust are a happy example of the other side of the question. Where, as in the former instance, the ground belongs to a public body, which has displayed great spirit in other respects, we might reasonably have looked for a different result; but *laissez faire* obtains here, as elsewhere, so far as art is concerned.

Two companies have been formed with the view of providing new cemeteries to the south-west of the city, the one to the south of Morningside, and the other to the west of Merchiston. Both schemes meet with opposition from the proprietors of villas in the vicinity, and a paper war has been raging on the subject. It is a singular fact, however, that when a cemetery is formed in a neighbourhood, it is soon surrounded by houses if the sites are at all suitable.

The fever wards at the Royal Infirmary are approaching completion, but it will be at least two years hence before this extensive building can be in working order. As yet, nothing has been done as to clearing the site acquired for the extension of the University. It seems that more space is wanted for the requirements of the medical schools, and that a grant in aid is looked for from Government.

The city generally is in a very satisfactory condition as regards health, the death-rate being much below the average; and with the improvements going on, Edinburgh is not likely to lose its attractiveness as a place of residence.

#### HYDRAULIC REMAINS IN ITALY.

THE following interesting notes on some recently-discovered Roman remains have been communicated to the French Academy of Sciences by Father Secchi, the distinguished Italian astronomer, and are published in a late number of *Comptes Rendus*. These remains consist of:—

1. An aqueduct at Alatri, the supposed date of construction 200 B.C., supplied by an inverted syphon, having its point 101 metres (331 ft.) below the distribution level, and consequently supporting at the lowest part a pressure of at least eleven atmospheres. The supply-pipes are of terra-cotta embedded in solid rubble masonry; they are about 30 centimetres (12 in.) in diameter, jointed in a very solid manner, and formed of excellent earth. The total length of the aqueduct is about 12 kilometres (seven English miles). This remarkable construction appears to have served as a model to Vitruvius in his discourse on aqueducts with inverted syphons.

2. A complete system of drainage found in the neighbourhood of the same city, and formed of enormous pipes of porous earthenware, each about 1·10 metres (3 ft. 6 in.) long, 0·42 metres (16 in.) in diameter, and with an average thickness of 0·02 metres ( $\frac{1}{5}$  in.). The drainage was intended to carry off the water from a plain used as a military exercise-ground.

3. Areas expressly prepared with solid foundations, forming inclined planes, for collecting the rainfall over a large extent of surface, and conducting it to a settling basin, whence it was led off into reservoirs for storing. These collecting-grounds were formed on the summit of an eminence, and designed for the supply of the town of Segni.

4. An example of the method employed to prevent filtration in porous soil, by interposing layers of impermeable clay, to lead off the surface water to an aqueduct.

5. An ingenious arrangement for cooling the *acqua tepida*, which appears to have been found too warm for drinking after it had been led into the capitol. The spring furnishing the supply has been discovered and the temperature found to be 17° to 18° centigrade (62° to 64° Fahr.) only in winter, showing the need there was for intermixing it with the Julia water, which has a temperature of about 11° centigrade (52° Fahr.) only. It is interesting to note that the temperature of this spring must have varied very little within the last 2,000 years, as it is highly improbable that it would have been laid on to the city had its temperature exceeded 18° centigrade. This spring, now called *Peziosa*, rises in an extinct volcanic crater. The observation proves the extreme slowness with which cooling proceeds in the interior of the globe.

The notice concludes with an account of the method employed in getting rid of the carbonate of lime held in solution by the water in large quantities. It consisted in boiling the water, and cooling it suddenly by the application of snow to the exterior of the containing vessels.



## FROM GLASGOW.

**New Bird and Dog Market.**—In close proximity to the building recently erected to meet the requirements of the "old clothes" trade in Glasgow, there was opened recently a new bird and dog market, which has been erected by the Bazaar Committee at a cost of something like 5,000*l.* The traffic in household pets, birds and dogs, which has been an increasing one in Glasgow, was carried on for a period of thirty-three years in Police-lane. Being placed under the more-immediate control of the Town Council, the market was, in 1870, removed to Jail-square, the site of the present building, which has been erected with a view to the greater convenience and better accommodation of those engaged in the business. The new premises are one story in height, and consist of one large hall about 77 ft. long by 55 ft. wide at one end, and 35 ft. at the other, light being obtained from the roof. The plans of the new structure were prepared by Mr. Garrick, city architect, and the building operations have occupied over twelve months.

**Hutcheson's Hospital.**—Considerable renovations and improvements have recently been completed by Mr. John Baird, an old pupil of the original architect, in connexion with the Hutcheson's Hospital Building, Ingram-street. The edifice, which is regarded as one of the most commemorative in the city, was erected in 1802-5, from designs by the late Mr. David Hamilton, as a memorial to the charitable Brothers Hutcheson, when the old hospital in Trongate was demolished. The present building is about 50 ft. in height, and has a rusticated basement story, while the façade to Ingram-street, on the upper floor, has two Corinthian columns in antæ, flanked by pilasters of the same order, and in the niches between them, on either side, are the statues of Messrs. Geo. and Thos. Hutcheson, of Lamball, founders of a magnificent charitable and educational institution, of which the citizens are proud. Originally the interior of the building consisted of three floors, the street floor having a height of 11 ft., the hall above being 53 ft. in length, 25 ft. wide, and 20 ft. high, an apartment above this being formerly used for school purposes. The floor of the hall has now been raised about 3 ft., with a view to improve the street flat, which is at present occupied by Messrs. Holms Brothers, the well-known manufacturers, while the upper apartment has been removed, thus increasing the height of the hall to 30 ft.

## TWO YEARS' STREET-WORK IN LEEDS.

FROM a report made to the Council of the borough of Leeds by Mr. Alderman Tatham, the chairman of the Streets and Sewerage Committee, it appears that during the last two years as much as 25 miles 4 furlongs and 148 yards of sewers have been laid in that borough, and, in addition to this great length of sewers, there have been laid 5 miles 3 furlongs and 88 yards of branch-pipes from the sewers towards the houses, i.e., as far as the curbstones of the foot-paths; and that 2,801 street-gullies have been made and connected with the sewers by the contractors who have done the other work; but in addition to these the workmen regularly employed and paid by the corporation put in 395 new gullies, rebuilt 396 old ones, and repaired the large number of 2,024.

The cost of these extensive works has, of course, been great. The total cost of sewerage works, including the branches, has been, in the two years, 29,390*l.*

If we regard the surface-work of the streets the amount done appears equally large. The number of streets paved and flagged during the two years has been 146, being in length 7 miles, 3 furlongs, and 171 yards. When houses are built, and new streets laid out by the owners of the land, these are paved and flagged at the expense of those owners. They may do the work themselves, if they please, provided it be done under the direction, and according to the rules, of the Corporation; but as they cannot in general do the work for less money than the Corporation can do it for under their periodical contracts, the custom is that, in general, the Corporation pave and flag the new streets, and charge the expenses to the owners. It is usual to allow the greater number of houses intended to be built in a new street to be built before the paving or flagging is done, but inasmuch as, without some guide, the levels of the several door-sills would not be at all uniform, the ground is roughly

levelled, and the curbstones set from end to end of the intended street, from which, opposite to them, the levels of the several door-sills are fixed. With this explanation it is less surprising than it otherwise would be to see the total length of curbing done in the last two years, set down as being 17 miles, 3 furlongs, and 127 yards.

The total cost of paving, flagging, and curbing chargeable to owners has been 32,450*l.*, and the total cost of paving and flagging paid out of improvement rates, 1,860*l.* Thus the total cost of sewers and paving has been 64,120*l.*, or upwards of 30,000*l.* a year, taking a mean of the two years. These are works of and under the surface.

According to another report presented to the Council of the borough of Leeds by the Chairman of the Building Clauses Committee (Mr. R. Galloworthy, the present mayor), there were presented to that committee for approval during the last two years plans for the building of 7,559 houses, of which 4,874 were approved. The numbers for the year 1876 were about one-seventh greater than for the previous year, being 3,546 in 1875 and 4,013 in 1876 presented for approval, and 2,074 in 1875 and 2,800 in 1876 approved.

During the same two years the plans of 553 buildings were approved, consisting of mills, warehouses, stables, workshops, &c., and there were submitted plans for three churches, fifteen chapels, six mission-rooms, one synagogue, one Roman Catholic seminary, twenty-seven schools, two skating-rinks, one theatre, two circuses, three bridges, one orphanage, one dining-hall.

One thousand, two hundred, and forty-four dwelling-houses have been completed and certified for occupation during the present year. The population is, we believe, estimated at about 280,000 at this time.

## EXTENSION OF THE METROPOLITAN DISTRICT RAILWAY FROM HAMMERSMITH TO THE SOUTH-WESTERN LINE.

THE Metropolitan District Railway Company are at present engaged in the carrying out of extension works of an important character, which, when completed, will place their line in direct connexion with that of the South-Western Company, by a junction near the Shaftesbury-road Station, and thus give the Metropolitan District Company a through communication with Richmond and Windsor. The extension line commences by a deviation to the south of the District Railway, a short distance before entering the Hammersmith Station from North End, being carried on the same level until it reaches Broadway, when it crosses under that thoroughfare by a tunnel, the roadway being supported by twenty iron girders and brick arches. After passing under Broadway the line is continued underground on an ascending gradient, until it reaches the Grove, the roadway above being on supporters and arches similar to those in Broadway. From this point it is carried forward some distance, through an open cutting, and still on an ascending gradient, the line being inclosed on each side by strong retaining walls. It is thence continued on an embankment, crossing over Mansion House-street, which has been lowered 10 ft., by an iron girder bridge; also over Cambridge-road, which has also been lowered 8 ft., by a similar bridge. A short distance beyond Cambridge-road the line is continued on a brick viaduct of ten arches, and thence over Clifton-road by another girder bridge, close to which it forms a junction with the South-Western line, near the Shaftesbury-road Station.

The Hammersmith Station will be doubled in width by the extension, and there will be two sets of double lines of rails in addition to a separate line and sidings. The new sets of rails on the south side of the station will be for the through traffic to Richmond, whilst those on the north side will continue to be used for the local traffic between the Mansion House and the Hammersmith Stations. The central platform, a portion of which has been removed, in order to admit of one of the new lines of rails being laid down, will be reconstructed and lengthened, and a wide new platform will also be erected on the south side. For the purposes of the works several houses and shops, on both sides of Broadway, have been purchased and taken down by the company, as well as other buildings on the line of route. In consequence of some portions of the line passing under the level of the sewers be-

longing to the Metropolitan Board of Works the railway company have had to construct a new sewer, about 200 yards in length, the dimensions of which are 4 ft. by 3 ft. The company are likewise under an obligation to make a new road from Broadway to Grove-road, 40 ft. in width, and also to raise the level of Bradmore-lane 6 ft. Several portions of the works are already in a forward state, the tunnel under Broadway being nearly completed, as well as the covered way in continuation, and the retaining walls enclosing the open cutting, to the point where the embankment commences, and likewise the bridges and viaduct. It is expected that the extension works will be finished and ready for the through traffic to Richmond about March next.

The works are being carried out by Mr. Gilbert, the company's engineer, Messrs. Lucas & Aird being the contractors. The Thames Ironworks Company supply the girders and iron, and Mr. Cleaver is the sub-contractor for the brickwork. Mr. Price is the general superintendent in charge.

It is stated that in constructing the tunnel it has been found that great facilities exist for joining the District and Metropolitan systems, and that a very slight extension only will be required, with a trifling ascent from the District to the Metropolitan, to complete the "outer circle." It is added that negotiations for effecting this completion have already taken place, and that a prospect exists of its being shortly carried out, when much change and inconvenience will be avoided.

## A NEW MISSION HOUSE, OLD KENT ROAD.

THE Bishop of Guildford has laid the foundation-stone of a new mission-house, which is about to be erected in connexion with St. Philip's Church, Avondale-square, and which was consecrated and opened a few months ago. The building is intended to be utilised for general secular purposes, as well as for those of a distinctly religious character, for the benefit of the rapidly-increasing vicinity of Avondale-square, which was only the other day a field, but is now almost covered with a very good class of houses, as well as several of those more especially suited to the labouring population. The new building, the site of which is immediately alongside the church, will be uniform with the last-named structure in its architectural features, which are Gothic, and the materials are Kentish rag and Bath stone. It will consist of one lofty story, with an ornamental gable at each end, and will contain a spacious public room 180 ft. in length, and 40 ft. in width, together with committee and retiring rooms. The architect is Mr. Richard Coe, of Furnival's Inn, and the builders are Messrs. Laphorne.

## NEW TOWN HALLS.

**Newbrough.**—On the 15th inst. the foundation-stone of a new town-hall was laid at Newbrough, Northumberland, by Miss Todd, of Newbrough Park, at whose sole cost the building is being erected. The building will consist of a main front two stories in height, with a public hall behind. The hall will be lighted from the roof. The building is designed in the Italian style. The principal elevation next the main road will be divided by pilasters into three divisions. In the centre division is the main entrance; this part of the façade being carried up above the parapet, surmounted by a moulded pediment on pilasters with a centre opening for clock dial. At each side of the entrance on the ground floor are double windows circular-headed; the first-floor windows having architraves and square heads. Above this the parapet has been carried up with dwarf pilasters and turned balusters. The walling is built of chiselled block, in courses, with moulded and chamfered stone dressings. The contractors are Mr. Thomas Welton, of Birtley Shield, and Mr. John Martin, of Bellingham; and the architects are Messrs. Thompson & Dunn, of Newcastle-upon-Tyne.

**Lochmaben.**—The Lochmaben town-hall committee have resolved to advertise for tenders for the erection of the new town-hall. On the ground-floor to the west will be the council-chamber, town-clerk's chamber, reading-room and library, record office, &c.; and to the east the market-hall. The town-hall, which will be 50 ft. long



by 20 ft. broad, will be on the upper floor, reached by a staircase on the east end of the building, the general entrance being to the front under the steeple. There will be, on the upper floor, also, an ante-room, cloak-room, &c. The present steeple will be overhauled. The estimated cost is upwards of 1,000*l*.

*Inverness.*—At a meeting of the special town-hall committee of the Inverness town council, on the 14th inst., it was agreed to instruct the town clerk to return the different plans and designs to the respective architects, along with an expression of thanks for the attention given to the council's request.

#### NEW BANKING PREMISES.

*Chippenham.*—The Wilts and Dorset Bank is about to erect new premises in High-street, Chippenham, on the opposite side of the street to its present offices. The tender of Mr. Long, of Bath, has been accepted by the directors, at the sum of 3,920*l*. The highest tender was 5,000*l*.

*Warrington.*—The increasing business of Parr's Banking Company, Warrington, has rendered it necessary that their premises at the head office in Warrington should be re-arranged and considerably enlarged, and during the past twelve months Messrs. Gibson & Son have been engaged in erecting, in the rear of the existing premises, a large building which is to constitute the future telling-room of the Bank. The telling-room, which is now approaching completion, is 66 ft. by 60 ft. The centre portion, 36 ft. in width, is supported by eight massive pillars of red Aberdeen polished granite, 20 ft. high, including the richly foliated caps and stone-moulded bases. A bold cornice with cantilevers, dentils and foliated enrichments, is carried round the central portion above the capitals, and from this springs a deeply-coved ceiling. An abundant supply of light has been obtained, the whole of the centre and two side ceilings being arranged in panels of tinted glass, supplied by Messrs. Edmundson, of Manchester. A dado is formed with Minton & Taylor's glazed encaustic tiles and majolica, 4 ft. 6 in. from floor, finished with polished oak surbase and moulded skirting. The flooring is in two thicknesses,  $\frac{3}{4}$ -in. red deal, covered with  $1\frac{1}{2}$ -in. pitch pine. The public space, 36 ft. by 16 ft., will be covered by Dantzic oak flooring and parquetierie border from Messrs. Gillow. The blank walls on the south side are panelled and moulded to correspond with the windows on the north side. The end window is executed in Caen stone, with three granite columns from Shap. The doorways are surmounted with pediments, filled in with enrichments in plaster and carried on ornamental trusses. On the east end of the telling-room are placed rooms for the directors, manager, &c. The lavatories have been fitted up by Messrs. Jennings, of London. The heating apparatus and warming arrangements are being carried out by Messrs. Newton & Chambers, of Sheffield; and the desks and fittings are being made by Messrs. Garnett & Sons, from designs specially prepared by the architects. The building is in the Italian style; the painted decorations being executed by Messrs. T. Hesketh & Son, of Warrington; and the plastering, &c., has been done by Mr. T. Jones, of Liverpool. Mr. Williams has acted as clerk of works; and the general contractors are Messrs. Gibson & Son, who have carried out the work from plans and designs furnished by the architects, Messrs. John White & Co., under the immediate superintendence and direction of Mr. Beesley.

#### NEW DOCKS.

*Devonport.*—The enlargement or reconstruction of No. 3 Dock at Devonport Dockyard has been undertaken by Mr. J. Pethick, contractor. It will be 450 ft. long, 45 ft. deep, and will be about four times the present area. The bottom will be slightly elevated in the centre, sloping towards the ends, thus obviating the present inconvenience felt by the docks, as at present constructed with flat bottoms, being always wet. The cost of its construction is estimated at little short of 200,000*l*. 20,000 tons of Dartmoor granite will be used, and this is now being hewn at Princetown. The cost will be distributed over the Navy Estimates for the years 1876-7-8-9. It will therefore be four years in hand. It is stated that to avoid controversy, should it be deemed advisable, as the work proceeds, to modify or in any way alter the plans, and also

to enable a strict Government supervision of the work, it has been decided to depart from the usual system of contracting for the work in block, and to accept contracts for the work as per measurement. It will, therefore, be built upon the piece-work basis, entirely under the control and supervision of the Government officials and the director of Works Department.

*Middlesbrough.*—The new graving-dock which has been constructed near Normanby Jetty, at Middlesbrough, has been formally opened. The construction of this dock was undertaken by the Tees Conservancy Commissioners, at the solicitation of the shipowners and others trading on the Tees. The dock is 500 ft. long, 25 ft. wide at the entrance, 50 ft. wide at the foot, and 70 ft. wide at the head. The depth is from 16 ft. 6 in. to 18 ft. It lies in a transverse position to the river. The contract has been carried out by Messrs. Ridley & Hodgson, of Middlesbrough and Newcastle. Messrs. Gwynne & Co. of Essex-street, Strand, have supplied two centrifugal pumps of such power that the dock can be pumped dry in two and a half or three hours. Each of these engines has a cylinder of 18 in. diameter, by 18 in. stroke, working at a pressure on the boiler of 50 lb. per square inch. Each is capable of lifting 10,000 gallons per minute. The drainage pump is 6 in. diameter, 6 in. stroke, and capable of lifting 500 gallons per minute. The whole of the work has cost about 35,000*l*. The Commissioners have reserved land in the immediate neighbourhood of the dock, in order that another dock may be constructed if necessary.

*Whitehaven.*—The new wet-dock at Whitehaven was opened on the 23rd ult. It has been constructed from plans by Mr. Brunlees, C.E., who has been authorised by the Dock Trustees to proceed with the preparation of plans for the construction of a graving dock, also of a railway to connect the extreme points of the harbour, and likewise to deepen the same at the present frontage, where an accumulation of sand has taken place. The works have been in progress for the last five years.

#### NANT-CLWYD HALL, NEAR RUTHIN.

The estate of Nant-Clwyd, situate about four miles from Ruthin, and until within the last few years the property of Mr. Richard C. Naylor, by whom it was sold to its present proprietor, Lieut.-Col. Naylor Leyland, has recently undergone extensive improvements. The work first undertaken has been the mansion, the older portions of which are reputed to have been from the designs of Inigo Jones. Although the house had been considerably enlarged in 1857, by the owner, under the direction of Mr. J. K. Colling, architect, of London, and the additions at that time consisted of a new saloon, entrance-hall, and bedrooms, yet the old servants' offices remained; and the staircase, which was a fine specimen of Italian foliated work in oak, with grotesque figures on carved newels, and scroll balustrades, lost much of its effect from the contracted space in which it was placed; and the arrangements of the house being insufficient for Colonel Leyland, he determined upon doubling its capacity, and called in the services of Mr. David Walker, architect, Liverpool, who has so enlarged and improved it as to render it one of the most complete country residences in the Vale of Clwyd. The additions embrace a large range of kitchens, offices, servants' hall, housekeeper's, and other apartments, covering a ground-floor area of 600 square yards, with servants' bedrooms, ranges of stable offices, coachman's house, &c., whilst the reception-rooms consist of a banquet-hall, 30 ft. by 52 ft. and 23 ft. high; drawing-rooms, billiard and other suites of private apartments, and a magnificent staircase of oak, in which the old work has been incorporated, and the new finely-carved work designed to correspond. A long corridor, 10 ft. wide, with a dark oak dado, leads to the banquet-hall, an apartment with a richly-panelled and coffered timber ceiling, and a multi-form-panelled dado of finely-marked oak, broken on two sides by massive oak and marble chimney-pieces, carved by Rogerson, of Liverpool. The floor has a wide margin of Arrow-smith's parquet, the centre being laid for dancing. The exterior of the old house is of the period of James I., with high-pitched roof and other characteristic features, and the new work has been carried out in the same style. The general facing of the walls is of red brick, with quoins, architraves, and pediment heads of

Minera stone, with carvings in the tympanums. A new drive, with entrance-gates, and lodge, has been constructed, and the ground laid out by Messrs. F. & A. Dickson, of Chester. The several works have cost over 20,000*l*. The contractor for the buildings was Mr. D. Readdie, of Liverpool, Mr. William Laidlow being clerk of the works; the architect, as before mentioned, being Mr. David Walker.

#### THE GRAND LODGE TEMPLE IN PHILADELPHIA.

AMERICAN FREEMASONS.

AMONG the many handsome buildings erected by the Freemasons of America, none can rival the Temple of the Grand Lodge of Philadelphia. This costly building is in the style of architecture called by the Americans, "Norman," probably because they are under the impression that their forefathers, the English, who introduced it in America, obtained something like it in the time of William the Conqueror, from Normandy. The principal corridor, 20 ft. wide, and 250 ft. long, built in the Doric style, is reached from the external portal. The library of the temple, 30 ft. high, 45 ft. broad, and 65 ft. long, is adorned by a double row of columns; the banquetting-hall, of the same height and breadth, and of nearly double the length, which has its walls decorated with paintings of flowers, fruit, and birds, is lighted by fifteen candelabra. At the upper end of the principal staircase is a fountain, round which groups of exotic plants will be placed. The hall of the Grand Lodge is executed in the Corinthian style, and its decorations are of a gorgeous description. The subjects are the symbolic figures of Freemasonry. The chapter-room is in the style of Italian Renaissance; then follows an Egyptian hall, fitted up like an Egyptian temple; then a Norman and an Ionic hall, a hall of commanders of Great Temples in the Corinthian style, and yet many other rooms and halls, all fully decorated. The tower forming the right-hand corner of the temple has a height of 250 ft. Fireproof vaults in the basement contain the archives and insignia of the Grand Lodge. The building has consumed about ten millions of bricks. Some idea may be formed of the wealth of the Grand Lodge of Pennsylvania, when it is stated that during the three or four years taken for the erection of the temple they have expended on it \$1,400,000.

#### LONDON STREET ARCHITECTURE: 79, MARK-LANE.

OUR engraving illustrates the Mark-lane front of a block of buildings, having even a larger frontage towards London-street, and which is being erected for Messrs. Sandon Brothers, of St. Swithin's-lane, upon the site recently occupied by Nos. 76 to 81, Mark-lane, and Nos. 14 to 18, London-street, and covering an area of about 11,300 ft. Being in the centre of the corn, wine, and shipping trades, two stories of cellars have been constructed, connected with offices on the ground-floor.

The upper portion of the building is arranged as suites of offices, and is approached by a double stone staircase, which ascends from the central corridor, there being entrances both from Mark-lane and London-street.

The tympanum of the pediment over the entrance in the Mark-lane front is enriched by sculptured figures of Bacchus and Ceres, and that of the London-street front by figures of Neptune and Europa. Both fronts are of stone.

The buildings were designed, and are being carried out by Mr. W. Seckham Witherington, of Leadenhall-street. The total cost is estimated at about 40,000*l*.

*City Improvements.*—At a meeting of the City Commissioners of Sewers, on the 19th inst., Mr. Deputy H. L. Taylor said he had brought before the Metropolitan Board of Works the question of contributions towards their improvements. Out of the 120,000*l*. which the Board had Parliamentary power to expend with regard to improvements in the Metropolis, 60,000*l*. were allocated to the City towards the improvements undertaken by this Commission. Of the 60,000*l*., there was a balance of 23,582*l*. due to them. Acting on the instructions of the Commission, he had brought the matter before the Board, who had agreed to advance 23,000*l*. of the 23,582*l*.





FREEMASONS' GRAND LODGE TEMPLE, IN PHILADELPHIA, U.S.





LONDON STREET ARCHITECTURE: 79, MARK LANE.—MR. W. S. WITHERINGTON, ARCHITECT.



NEW CATTLE MARKET AT STOCKTON.

On the 13th inst. a new cattle-market, which has been in course of construction since June last, was opened at Stockton. For many years the market has been held in the High-street, but it was felt that the holding of it in a crowded street was a great inconvenience. The desirability of removing the market was brought before the Town Council, and eventually it was decided to utilise the Green, a large space lying behind the parish church, close to the High-street. Mr. Geo. Edwards, the borough surveyor, submitted, in August, 1875, a plan for its conversion into a cattle market. That plan provided for the division of the space into three sections. The west-end section, immediately behind the church, and nearest to the High-street, was to be furnished with 59 fat-cattle pens, each to hold 10 animals; and the east-end section with 23 store-cattle pens, each to hold 26 animals. The centre section was to be allotted for sheep and pigs, and 200 sheep-pens and 42 pig-pens, each capable of holding 12 animals, were proposed to be constructed. With the exception of a few minor details, the work has now been completed. The whole is surrounded by trees and substantial iron railings. The contractors were:—Pens, Mr. Thomas Hanvy, Stockton; outer railings, Messrs. R. & S. Adams, Gainford; excavating and formation of foundations, Mr. Nicholson, Stockton; the paving was done by the Corporation. The total cost of the market, including the amount expended in acquiring the vicarage and land behind, and the Commissioners' interest in the Green, is estimated at between 17,000*l.* and 18,000*l.*

RAILWAY DEVELOPMENT.

In the course of his inaugural address on the 14th inst., as President of the Civil and Mechanical Engineers' Society, Mr. R. M. Bancroft said that in 1819, when Thomas Gray, the first promoter of railways, published a work on the subject, he was considered little better than a madman; but his name, associated with those of Joseph Sanders and William and Edward Pease, should always be held in respect, for these were the men who first promulgated and brought the subject commercially home to the people of their time.

Fifty-four years ago it took seventeen hours, and forty years ago mail coaches were fourteen hours, running from Derby to London, the distance being about 130 miles; the outside fare 30*s.*, and the inside fare 52*s.* The charge for sending letters at this time was 10*d.* each. To send silk goods by boat cost 5*s.* per cwt.; other goods, from 3*s.* 6*d.* to 5*s.*, according to their value. To send goods of all sorts by Pickford's vans, or by coach, the charge was 14*s.* per cwt.

In addition to paying their fares, passengers had to stop for refreshments three times on the journey, and each time there was a change of coachmen and guards, who had all to be fed. The Midland Company, as all know, will now take you this journey in about three hours, the third class fare being 10*s.* 7*d.*; and the first-class fare 17*s.*; such is the change that has been brought about by railways.

The following statistics, compiled from six of our principal companies' half-yearly reports, will in some measure serve to show us what magnitude railways have grown to in the United Kingdom:—

Table showing Mileage, Number of Stations, Locomotives, Passenger, Goods, and Mineral Rolling Stock, &c., possessed by Six Principal Railway Companies.

Name of Railway.	Miles authorised.	Miles constructed.	Number of Stations.	Men and Boys employed.	Horses.	Locomotive Engines.	Locomotive Tenders.	First-class Coaches.	Second-class Coaches.	Third-class Coaches.	Composite Coaches.	Luggage Break and Post-office Vans.	Horse Boxes.	Carriage Trucks.	Total Coaching Stock.	Cattle Trucks and Sheep Vans.	Goods Wagons.	Coal, Coke, and Mineral, &c.	Timber Trucks.	Permanent-way Trucks.	Goods Break Vans.	Total Merchandise and Mineral.	Lorries, Drays, Vans.	Total Receipts for Half-year ending:—	
Great Western ...	2071	2026½	601	34,685	1500	1461	986	476½	429	1172	589	537	455	436	4007	1329	25,685½	1701	2000	741	704	32,160	104	£. s. d.	
London & N. Western	1684	1590½	756	40,000	1591	2032	1733	1684	181	1168	688½	553	509	4777	2006½	36,560	3025							3,479,549 5 6	
North Eastern	1520½	1411	456	25,000	926	1364	272	230	1049	317	385	238	86	2677	1357	20,063½	47,000	688½	562	801	76,464			4,410,927 19 3	
Midland	1534	1393½	507	30,000	2608	1261	1116	324	1281	656	494½	352	236	3343	1285	25,508½	1963	1635		825	31,156	1837		3,142,245 0 2	
Great Northern	857	695½	265	16,100	1340	566	463	204½	221	594	277	169	145	954	1728	505	13,934½	205	250	397	402	15,696	112		2,940,984 11 5
North British	795½	782	327	11,483	1091	453	385	298	105	628	145	149½	150	104	1579	718	533	21,888							1,399,484 2 3
Totals	8485½	7871½	2993	157,268	9074	7137	4683	3294	1166	5892	1854	242½	1893	1466	18,103	7262	122,283	75,725	10,566	1804	3045	18,523	3121		£16,444,153 13 11

1 Carting at all principal stations done by contract.  
2 Three royal carriages.  
3 Twenty-three saloon carriages.  
4 Including 2,846 covered trucks.

5 Included in first class.  
6 Including thirty-seven Post-office vans.  
7 Including fifty-five Post-office vans.  
8 Including 440 covered trucks.

9 Including one Post-office van.  
10 Forty-eight open, forty-seven covered.  
11 Including 100 sheep-trucks.  
12 Including 905 covered trucks.  
13 Including 1,019 covered trucks.

MELBURY CHURCH, DORCHESTER.

This church has been lately re-opened, after having been fully restored at the sole cost of the Earl of Ilchester. The church is situated within the park, and close to the mansion at Melbury. It is small but most perfect in form; consisting of nave, transepts, and chancel, with a square tower at the intersection, and is all of the same date,—the fifteenth century. It is wholly built of Ham-hill stone, and the exterior is in a very good state of preservation. Crosses have been added to the gables where deficient, and figures on pedestals (consisting of the four Evangelists) at the feet of the gables to the transepts,—St. Peter and St. Paul at the east end, and Moses and David at the west end. The supporters of the family, the fox and the lion, have been also added at the angles of the tower, seated on pedestals.

Internally the ceilings were of plaster throughout, and the fittings of late eighteenth-century work. New oak open timber roofs have been substituted for the plaster ceilings. That in the nave is a hammer-beam roof with carved bosses, and supported on sculptured and carved stone corbels. The roof of the chancel is vaulted in oak, divided into elaborate and richly-carved panelling. The tower has a new oak ceiling with arched ribs and central glazed oak lantern, admitting the light to the church from the belfry windows.

The nave and transepts are filled with open oak benches with carved arm-rests, carved panel backs, and carved front panelling. The chancel is filled with richly-carved oak stalls, having the supporters and arms of the family on the stall-ends. The pulpit and reading-desk, which are of oak, are carried out in the same manner, with open carved panelling, and foliage and flowers intermingled with the tracery. The reredos, which is also new, is formed in Caen stone, containing in the centre the Last Supper executed in alto-relievo in statuary marble. The sides of the reredos are divided into compartments, having enriched and projecting ogee canopies, over bas-reliefs in alabaster, consisting of the emblems of the four Evangelists, the holy dove, the pelican in its piety, the three fishes, as emblematical of the name of Christ, and the Agnus Dei. The side-walls above the stalls have enriched panelling in Caen stone, filled in with marbles in geometrical patterns. The plain portions of the reredos, as well as the dado within the altar-rails, are also inlaid with polished marbles in pattern, and the shafts of the columns to the reredos and the windows are of green marble. Above the springing of the side-windows, and over the east window, the walls are again inlaid with coloured marbles in geometrical patterns. The remaining portions of the walling throughout the church have been lined with Ham-hill stone ashlar. The floors have been laid with Minton's tiles.

The carving is arranged from natural foliage, interspersed with birds, insects, animals, &c. The variety in the foliage, both in wood and stone, is very great, there being scarcely two examples alike throughout the whole work. The architect was Mr. James K. Colling, and the carving was all executed from full-sized drawings and designs made by that gentleman with his own hands. The sculpture, carved stonework, and marble inlay, as well as the whole of the oak seating, stall-work, pulpit, desk, &c., were carried out by Mr. James Forsyth, of Edward-street, Hampstead-road. The carved oak roofs

were by Messrs. Cornish & Gaymer, of North Walsham, and the restoration of the heraldic glass, new windows in the nave, as well as the new east window representing the ascension of Our Lord, were executed by Messrs. W. M. Pepper & Co., of the Euston-road.

The church contains some interesting monuments belonging to the ancestors of the Earl of Ilchester; the Fox-Strangways, especially two canopied tombs in Purbeck marble, with recumbent figures in alabaster, in excellent preservation, of knights in full armour,—one, that of "Sir Gyles Strangways, Knight," the date of which is 1532. There is also a brass, which was in the floor, to this knight, with a figure also in armour, accompanied by his arms and that of Lady Jane, his wife, eldest daughter of John Mordaunt, of Meryfylde, esquire; also the arms of Henry Strangways, esquire, who died at the siege of Bolleyn, and of Margaret, his wife, daughter of Lady George Ross. These, with other remains of brasses, have been taken up and placed, so as to preserve them, upon the transept walls, inlaid on Purbeck marble slabs, with inscriptions beneath saying from what parts of the church they have been taken. There is also a beautiful kneeling statue by Chantrey, of a former Countess of Ilchester, mother of the present Lady Caroline Kerrison, of Oakley Park, Suffolk.

DRAINAGE MATTERS.

Rhyl.—The Rhyl commissioners and rate-payers have been greatly astonished by the amount of estimated expenditure necessary for the completion of an entire system of drainage. Mr. Baldwin Latham, C.E., estimates that the drainage and providing for an outfall by gravitation will cost 28,000*l.*, whilst the outfall, managed by pumping, would cost 23,000*l.*, but the latter would take 400*l.* yearly to work it.

Bognor.—Mr. H. Denman, of Brighton, was lately engaged by the Bognor Local Board to report as to the best means of carrying off the sewage of the town. The present drain in High-street and West-street he proposes to intercept at two points, viz., at York-road and at the south end of West-street, by this means utilising nearly the whole of the existing drains. The present outfall at West-street he proposes to alter, and retain as a storm overflow, which will greatly help the discharge in case of a sudden glut. He proposes placing the outfall chamber at the south end of York-road; thence the sewage will be taken by a cast-iron 24-in. pipe, bearing eastward to a point about due south of Black Rock. This in itself will have the advantage of taking the sewage to the eastern extremity of the parish, and the tide will complete the scheme, running as it does four hours and a half to the east, and then returning westward. By this means, the sewage will be taken right away to the eastward, it being allowed to flow in during a portion of the time the tide is running east, so that it will not return. The whole cost is estimated at 6,646*l.* The Board has decided on carrying Mr. Denman's suggestions into effect.

Selkirk.—The Selkirk Town Council on the 11th inst. resolved to take steps to secure the thorough drainage of the town, and afterwards proceeded to appoint an engineer, the Provost moving that Mr. Carter, Edinburgh, be employed. He said Mr. Carter was well acquainted with the connexion of pipes and drains, and house-pipes, and with trapping and ventilation. Mr. Scott moved the appointment of Mr. Young, C.E.,



Perth, as he had been formerly engaged in surveying the town for the purpose, and his plans had been accepted. A good deal of discussion followed as to the appointment, in the course of which the Liernur system of pneumatic drainage came up. Upon a vote being taken as to whether the Town Council should employ Mr. Carter or Mr. Young as their engineer, six voted for the Provost's motion and nine for Mr. Scott's. The motion to employ Mr. Young was therefore declared carried.

#### WATER SUPPLY.

**Heanor.**—New waterworks are to be erected at Langley, Heanor, by the Heanor Local Board. The estimated cost is 10,300*l.* Mr. Richards, of Langley, is the engineer, and has prepared a plan for submitting to the Local Government Board in London.

**Richmond.**—It would seem that Richmond is threatened with a discontinuance of its water-supply. For several months the Select Vestry of Richmond, Surrey, being dissatisfied with the quantity and quality of the water supplied to the town by the Southwark and Vauxhall Company, have been engaged in carrying out works for the supply of water to the town from an artesian well. Application was made by the Southwark and Vauxhall Company to Vice-Chancellor Malins to restrain the vestry from proceeding with the works, but it was dismissed with costs. On the 19th inst., at a meeting of the vestry, a letter was read from Mr. Rumble, engineer to the company, stating that in going through the papers in connexion with the late legal proceedings, and reviewing the decision of Vice-Chancellor Malins and the several Acts of Parliament relating to the Richmond Water Company, and also those relating to the Southwark and Vauxhall Company, he was compelled to come to the conclusion that the company had no Parliamentary right to extend the water-supply for the use and convenience of the inhabitants of Richmond, or for other sanitary purposes. Under these circumstances, acting under the instructions of his directors, he was obliged to give the vestry notice that, on and after the 13th day of January next, the company would cease the water-supply to the town of Richmond, and, in order to make the cessation complete, on that day he proposed to cut off all connexions of supply, unless the vestry were prepared to pay compensation for the continuance.

**Taunton.**—The Taunton Local Board of Health have resolved to apply for leave to borrow 30,000*l.* for purchasing the waterworks and other rights to enable them to supply the town with water.

**Peebles.**—At a recent meeting of the Peebles Town Council, the plans submitted by Mr. Buchanan, C.E., for increasing the supply of water were taken into consideration. Mr. Buchanan's scheme was generally approved of, and details were remitted to a committee, with a view to meet the engineer, and report to the Council at an early date, so as to allow the works to be proceeded with immediately. The present supply of water from Meldon Barn was introduced nine years ago, at a cost of about 5,000*l.*, and was then thought to be sufficient, but the town having since that time greatly increased, chiefly through the erection of two large factories and numerous villas, a scarcity of water has been for some years experienced. The additional supply, together with the improvement upon the drainage, is estimated to cost 1,500*l.*, and to increase the present supply of thirty-one gallons per head on a population of 4,000 to forty-seven gallons.

**Downpatrick.**—Mr. Bateman, C.E., has reported to the Downpatrick Water-supply Committee on the schemes proposed by Messrs. Ancketill and Stockdale, Mr. Henry Smith, C.E., and Mr. H. N. Reid. The report stated that the scheme of Messrs. Ancketill & Stockdale was decidedly the cheapest and best which had yet been projected. Mr. Bateman believed, however, that it could not be carried out for less than 6,000*l.*, to which must be added the cost of pumping and the rent of the mills; "still," continued Mr. Bateman, "even including these items, it is cheaper, and, in my opinion, a better scheme than Mr. Smyth's Struall project, or than any of those which I had before me at the time of making my former report." After some discussion, it was resolved,—"That this committee, having an aversion to supplying the town by means of pumping, and preferring that by gravitation, recommend the adoption

of Mr. Reid's plan from Tanaghmore, at a cost not exceeding 9,500*l.*, provided that, on an analysis being obtained, the water be found unobjectionable." It was further resolved,—"That, in case Mr. Reid's specification should not, at the cost of 9,500*l.*, satisfy the Local Government Board, or that the quality of the water be not satisfactory, then we recommend the adoption of Mr. Bowers's scheme at a cost not to exceed 13,000*l.*, with a 7-in. pipe."

**Exeter.**—At a meeting of the Exeter Town Council on the 15th inst. the town clerk mentioned that he had received a report from Mr. Richard Hassard, C.E., of London, relative to a new water-supply for the city. As the document was a very lengthy one, it was referred to the sanitary committee.

**Tunbridge Wells.**—After a long debate the Local Board has decided upon proceeding at once with an enlargement of the water-supply of Tunbridge Wells, at an estimated cost of 32,000*l.* Considerable difference of opinion exists as to the exact amount of the present supply. The yield seems to vary from 250,000 to 500,000 gallons a day, in the different seasons of the year, and unceasing.

**Mexborough.**—At a meeting of the Mexborough Local Board, on the 7th inst., Mr. Tomlinson, C.E., attended to explain certain schemes which he was prepared to carry out, the Government inspector (Mr. W. J. Sendall) being present. Mr. Tomlinson said there were several schemes which were feasible for Mexborough. One was to obtain a supply from Sheffield, which would, perhaps, be the most costly. Then there was the St. Helen's and Ludwell scheme, and a supply might also be obtained from the east end of Mexborough. He was of opinion that the interests of the town would be better served by a company. As a rule, companies were doing better than local authorities in this matter. He was quite prepared to form a private company to carry out the water scheme at once, and have it finished during the next summer, provided the Local Board would offer no opposition. He would undertake to find a supply for double the present population, and satisfy the demands of the Local Government Board. The late Dr. Fairbank (medical officer of the Board) had said that the Local Government Board would not sanction a scheme which gave a less supply than twenty gallons per head per day. Now he (Mr. Tomlinson) would emphatically deny that; he had seen Mr. Rawlinson, of the Local Government Board, and had put the question to him, and that gentleman told him that if he presented a scheme for Mexborough, or any where else, giving a supply of ten gallons per head per day, he would pass it. He was quite prepared to carry out a scheme, and a good one too, for 4,000*l.* Mr. Sendall asked if Mr. Tomlinson included a reservoir in his calculation? Mr. Tomlinson: Yes, a covered reservoir. The further consideration of the subject was adjourned.

#### NEW FOUNTAINS.

**Leek.**—A drinking-fountain, the gift of Mr. William Challinor, has been erected at the bottom of the Market-place, on what is known as the "Butter-market," where the so-called old Town Hall recently stood. The designer of the ornamental portion of the fountain is Mr. Joseph Durham, A.R.A. The work consists of a double drinking-fountain, cast in bronze, showing two nude children gambolling among the water-flags, until one detects a frog and recoils with child-like horror, while the one on the other side continues his laughter and his game. This part of the work was in the last Academy Exhibition. The base of the fountain consists of an octagon pillar, resting upon a series of four steps, while upon the pillar is this inscription,—

"From limpid streams beneath the rocks and heather,  
"A thing of beauty is a joy for ever."

Upon this pillar rests a circular basin of red polished granite, which was executed by Mr. Robertson, of Aberdeen, and which came from quarries at Peterhead, north of the town. A portion of the design includes a single jet of water rising from the centre 3 ft. in height; but this will not be usually in play.

**Cahir, Ireland.**—A new fountain in connexion with the supply of water from the Scarragh mountains to the inhabitants of Cahir, has been erected in the Square, nearly opposite the Glen-gall Arms Hotel, through the munificence of Lady Margaret Charteris. An octagonal basin, 8 ft.

in diameter, formed of cut limestone, 2 ft. 3 in. high, is useful as a font, from which horses and cattle can drink. A square plinth of cut-limestone, 2 ft. 6 in. on each side, and 2 ft. 3 in. high, is placed in the centre of this basin, on which is set a base that supports a circular column of limestone, 1 ft. 3 in. high, and 1 ft. 5 in. in diameter. A carved stone is placed on this, on which four lions' heads are formed, through each of which an ornamental iron pipe is placed that conveys the water on pressing a small brass knob. On this column, which supports the lions' heads, another of the same height is placed, the top of which is capped by a carving, somewhat of Corinthian form. A square stone rests on this, on the eastern side of which the date, 1876, is cut, and on the western the words, "In Memoriam," doubtless to the memory of the late and much-lamented Colonel the Hon. R. Charteris. This is surmounted by a canopy, supported by four small columns with grotesque lions' heads carved on the corners; and the top, consisting of a carved finial, with shamrocks nearly cut on each face. The entire forms a column, 11 ft. 6 in. high. The architect is Mr. Young, of Exeter Hall, London, and Mr. Sharpe, of Brunswick-street, Dublin, was the contractor.

#### NEW CEMETERIES.

**Taunton St. James.**—A new cemetery for the parish of Taunton St. James was consecrated on the 5th inst. The cemetery has been laid out, and the buildings constructed from the plans of Mr. John Beyer, architect, Bristol, which were chosen in competition. The cemetery is upwards of four acres in extent. The chapels occupy about the centre of the ground from north to south. The size of the Episcopal chapel is 33 ft. by 18 ft., standing due east and west; and at right angles with it is the Nonconformist chapel, 29 ft. 6 in. by 18 ft. A chancel is provided. A vestry, having a water-closet and lavatory, is attached to each chapel. Adjoining the chapels, and separated from them by glazed screens at the sides (and, in the case of the Episcopal chapel, opposite the entrance porch), are mortuaries, 14 ft. 6 in. long by 8 ft. each, for the reception of coffins during the performance of the burial service. The mortuaries are arranged with doors at each end, so as to afford the best means of ingress and egress, together with perfect ventilation. The walling is of Monkton stone. The quoins, tracery, and other dressings are of Bath stone. The shafts to the bell-turret are of Lydeard and Westleigh stone, rubbed and sanded, or tooled, according to the use made of it. The roofs are of red deal, covered with Bangor blue and Penmoyle sea-green slates in patterns. Internally the walls are stuccoed. The style adopted for the design is Early Pointed. The work has been carried out by Mr. Spiller, builder, of Taunton, under the superintendence of Mr. George C. Strawbridge, who acted as clerk of the works. The cost (exclusive of site) has been about 2,500*l.*

**Gloucester.**—An addition to the Gloucester Cemetery has recently been consecrated by the Bishop of the diocese. The cemetery was laid out, and the chapels, &c., built nineteen years ago from the designs of Messrs. Medland & Maberly, eight acres being appropriated to members of the Church of England, and four acres to Dissenters. The ground just added is between ten and eleven acres in area, nearly half of which has been consecrated.

#### OBITUARY.

**Mr. Joseph Burt, F.S.A.**—We regret to record the death of Mr. Joseph Burt, F.S.A., Assistant Keeper of the Public Records, and hon. secretary of the Royal Archaeological Institute. Mr. Burt died on the 17th inst., in his fifty-ninth year. The annual excursions of the Archaeological Institute for several years past have owed not a little of their success to Mr. Burt's uniform courtesy and business tact. His loss will be widely felt.

**M. D. Laurent de Lara.**—M. de Lara died at his residence, Torrington-square, on the 15th inst., aged seventy. He was for many years a member of the Society of Arts and an illuminating artist to the Queen. M. de Lara gained a prize medal for an illuminated chess-table on vellum at the Great Exhibition of 1851. He was the author of a manual on the art of illuminating, published by Messrs. Longman, which reached a fifth edition.



## DRURY-LANE MANAGEMENT.

THE discreditableness in front of the pay-place of the upper-boxes, or what is called the balcony, at Drury Lane Theatre, to which we have before now referred, was repeated on Tuesday, and ought to insure the condemnation of any management which permitted its recurrence. Without the slightest pretence of a barrier, a crowd of persons are allowed to fight and struggle first to get to the pay-place and then to get away from it. To make the matter worse, the patient people who have waited under the portico for the opening of what would seem to be the only door, find, when admitted, that a second stream is entering from an opening in the lobby of the Russell-street pit-door, which cuts them off from the pay-place. Watches are lost and dresses torn, and many give up the task as hopeless and go away. If this were an unexpected occurrence, the omission of proper means to remedy it might be pardoned, but occurring as it does year after year it is inexcusable and scandalous.

## MEANS OF EGRESS FROM THEATRES.

## THE LESSON OF THE BROOKLYN DISASTER.

THE dreadful calamity at the Brooklyn Theatre has impelled the Lord Chamberlain to look more heedfully into the means of exit in case of fire in London theatres. Captain Shaw has been instructed to look into the matter, and several theatres have already been visited, and examination being made not only of their means of outlet for the audience, but of the precautions taken against fire, the water supply, hose, and the like. Captain Shaw's report, if made public, would be fatal to the prosperity of any theatre he condemned. Captain Shaw's inquiry, too, might well be extended to music-halls, churches, and other buildings of public resort.

A "memorandum" relative to the means of exit from theatres in case of fire was issued from the Lord Chamberlain's office on the 21st inst., and a supplementary "memorandum," dated the 23rd inst., has also been issued, in which the Lord Chamberlain says:—

"Considering the crowded state of the theatres during the Christmas holidays, and more particularly the large numbers of women and children attending the performances of the pantomimes, the Lord Chamberlain requires that all doors not habitually used for exit, but available as additional means of escape in case of fire or alarm, be regularly opened on every occasion when a performance takes place, from Boxing-day until the 1st of February next. The Lord Chamberlain takes this opportunity of suggesting to managers the prudence of establishing among their staff of servants and attendants, before and behind the curtain, some sort of regular system according to which each person so employed shall be told off to his appointed station in case of fire or alarm, so as to prevent hesitation or confusion on any such emergency, and to facilitate the safe and quiet departure of the audience from all parts of the house, by all available means of exit."

## FINANCES OF THE INSTITUTION OF CIVIL ENGINEERS.

IN the report read at the annual meeting, on the 19th ult., it was stated that the property of the Institution comprised securities of the nominal value of £14,322l. 3s. 1d. held in trust for various purposes; of 22,494l. 1s. 8d. invested on the general account, and of a cash balance of 326l. 11s. 7d., together 37,142l. 16s. 4d., as against 35,297l. 15s. 8d. last year. Also, the stock in hand of the forty-six volumes of the "Minutes of Proceedings," numbering together about 7,000 volumes; the collections of original drawings and of portraits of past-presidents and other eminent engineers, to which a portrait of the late Mr. Joseph Miller had lately been added; and the library, unrivalled and unique of its kind, now containing 13,431 volumes, being an increase of 3,000 volumes during the past three years. These effects were insured for 10,000l. The statement of accounts showed receipts in the twelve months amounting to 11,181l. 17s. 7d., made up of three items, viz.:—To the credit of income, 8,844l. 10s. 4d., to that of trust funds, 459l. 19s. 3d., and to capital, 1,877l. 8s. The payments might be summarised under five heads, thus:—By house and establishment charges, 1,864l. 12s.; salaries and wages, 2,419l. 3s.; library, 605l. 4s. 3d.; publications, "Minutes of Proceedings," 4,055l. 15s. 4d.; and by premiums under trust, 313l. 7s. 8d.; while 1,847l. 17s. 3d. had been invested, and the cash balance was, as before stated, 326l. 11s. 7d. Favourable as these results appeared to be, they were not entirely so, the committee said, as the liabilities to the printers and engravers, as well as to the several

trust funds for unexpended dividends and to capital, were greater than at the same date last year. In fact, the expenditure now exceeded the income, though not the receipts, which comprised admissions and building fund fees hitherto regarded as capital.

## WARMING RAILWAY CARRIAGES.

WE alluded recently to the invention of a combustible compound by which railway travellers might make themselves independent of the "foot-warmers," and ensure warmth and comfort on a journey. The French Government, it appears, have ordered the adoption by French railway companies of some method of warming second and third class carriages during the winter months. No special system is enforced or suggested, and it is left to the discretion of the directors to adopt such measures as they may think most desirable. The specification of "second and third class carriages" in the order of the Government is a curious and perhaps unintentional satire on the policy of railway managers generally. It is certain that second and third class carriages will not be warmed to the exclusion of the first class, and, unless it is suggested that the richer travellers may continue to give their "tips" to the porters for the inevitable warm-water pan, while the poorer classes must have the same accommodation without being subject to this black-mail, some universal system of heating all the carriages alike will no doubt be adopted. There are many plans more or less suitable for making use of the waste steam of the locomotives for this purpose, and when any of them are adopted across the Channel we may probably expect to find a similar course carried out in this country.

## SEDIMENT IN WATER CISTERNS.

DR. STEVENSON MACADAM read a paper "On Sediments in Domestic Water Cisterns" at a recent meeting of the Royal Society of Arts, Edinburgh. He said that on several previous occasions, in referring to water supply and other sanitary matters, he had brought before the Society the question of the contamination of water in domestic cisterns, and the desirability of the cleansing out of the cisterns at short intervals. Lately, however, he had devoted special attention to the subject, and was now convinced that in many cases the evil effects of impure water supply were directly traceable to the contamination of the water by its being retained in cisterns containing deposits lying there for lengthened periods. These sediments in cisterns are primarily formed by the clayey and earthy matter carried by the water into the cisterns, and where, on settling, the suspended matter is deposited as an earthy-looking sediment. If these deposits solely consisted of earthy matter, there would be no serious objection to their remaining in the cisterns, but the analyses of a number of sediments taken from cisterns in different parts of Edinburgh and Portobello proved that the earthy matter was intermingled with minute particles of carbonate of lead, derived from the action of the water upon the lead of the cistern, as well as of organic matter, derived in part from ordinary street or house dust, and in other part from insects, &c., and even at times a stray mouse. When the water is being drawn from the cistern and fresh water is running in, a portion of the fine sediment is for the time raised in suspension, and flows out with the water, which thus becomes contaminated with lead and organic debris. Even when the cistern is emptied by the ordinary pipes, the sediment remains still further accumulating from time to time. The analyses of the water supplied to the city before entering the house-cisterns, and of the water which had stood for a week over the deposits or sediments from cisterns, showed that the water suffered serious contamination alike as proved by the proportions of saline and albumenoid ammonia determined in the million parts, or by the proportions of the oxygen, nitrogen, and carbonic acid dissolved in the imperial gallon, which formed a very delicate test of the purity of water, too much overlooked at the present day. The remedy lay in the periodic cleansing out of domestic cisterns, at least every three months, which should be done by taking out the waste-pipe and using a very soft brush for removing the sediment. Care must be taken that the surface or skin of the lead of the cistern be not disturbed or scraped.

## LORD SHAFTESBURY'S COTTAGES.

IN a pleasant article, headed "the Earl of Shaftesbury at St. Giles's House" ("Celebrities at Home"), the *World* says,—"Wimborne St. Giles is veritably a model village. Thatch, beautiful in a picture, but a bad sign in fact, has nearly disappeared, and wattle-and-dab has been completely replaced by brick. Here and there is a venerable cot, like that which on destruction was found to have received twelve coats of thatch, as infallible a sign of 324 years' life as the rings in a tree-trunk; but the old type has almost entirely vanished, and the new labourer's cottage, spick and span, brick-built, slate-roofed, and soundly constructed, has taken its place. These new cottages, in which Lord Shaftesbury takes great pride, are built in pairs. Each one contains its front parlour and back kitchen on the ground floor, above which are three bedrooms, absolutely unconnected with each other, and having independent doors opening on to the common landing. The landlord, energetically wielding his mighty walking-stick, points out with a quiet laugh that the long strip of garden with which each cottage is endowed is 'in front.' Lord Shaftesbury has no opinion of back gardens; 'public opinion cannot be brought to bear upon them, and they degenerate into dust-heaps.' The houses, 'you will observe, face the south; it saves a large per-centage of fuel during the mild winters of Dorsetshire, and ripens the apricots as well.' Every cottage has its apricot-tree, and the chronicles of these trees would bear no slight resemblance to a certain sacred narrative. Some are fair and well-grown, bringing forth fruit abundantly; others cling hopelessly to the walls, stunted and fruitless. Each cottage has also its pump,—or, rather, half a pump, for there is one between two,—its separate sanitary arrangements, its independent pigsty, and individual allotment of a quarter of an acre. For these accommodations, which, excluding the cost of the land, stand the proprietor in 160l. per holding, the 'down-trodden Dorsetshire labourer' pays exactly 2l. 12s. per annum, a fact which will explain the meaning of many landlords, who, when their farmers cry out for cottages, offer to build as many as they like if they will guarantee 5 per cent. on the capital invested. The owner of Wimborne St. Giles tells us that his labourers always pay their rent. Good times and bad he gets his 1½ per cent. well and duly paid; for there is sharp competition for his cottages, and the one bit of foresight shown by the Wessex husbandman is to keep a roof over his head."

## STATUES.

Sir Robert Peel.—The statue of Sir Robert Peel, in Parliament-square, has been completed and placed *in situ*. It is of bronze, and stands on a polished granite pedestal. This makes the third statue erected on the spot, the present one nearly facing Parliament-street; the others,—those of Lord Derby and Lord Palmerston,—stand opposite the Houses of Parliament. Mr. Edwards, who was entrusted by the late Mr. Noble, the sculptor, to carry out his works, writes to state that this statue is the last work of Mr. Noble. The commission for it was given to him by the friends of the deceased statesman, of whom the Duke of Buccleuch is the chairman, in order that this statue might be substituted for the one by the late Baron Marochetti, formerly erected in Palace-yard.

David Livingstone.—The statue of Dr. Livingstone, for George-square, Glasgow, will be completed, it is expected, about two months hence. The *Scotsman* states that Mr. Mossman, the sculptor, has succeeded in producing a statue worthy of his subject. His design represents Livingstone standing by the stump of a palm-tree, over which his cloak is carelessly thrown. The missionary seems in the act of speaking. The right hand,—in which is firmly clasped the well-known cap, which Livingstone always wore, as a sort of official badge,—rests upon the tree, as if partly supporting the figure; while the left holds a Bible, one of the fingers being inserted between the leaves. The statue, which stands about 9 ft. high, will be placed on a granite pedestal 11 ft. in height. Messrs. Cox & Son, London, are to be entrusted with the casting.

Robert Burns.—At a meeting of the committee entrusted with the arrangements for the unveiling of the Burns statue in January, held in Glasgow, the chairman, Mr. W. Wilson, said



the idea had been hinted at, and it was one of considerable importance; that a bust of Burns should be placed in Westminster Abbey. In her Majesty the Queen and in Dean Stanley he believed they would have allies when the time came for asking permission to place a bust of Burns in the "Poets' Corner." One of the delegates thought they should not lose their identity or nationality by sending a bust of Burns to Westminster. Why not place it in the Parliament House, Edinburgh? He thought they should try to get back the coronation-stone which was in Westminster. The chairman believed there might be a possibility, when Burns's bust was placed in Westminster Abbey that they would get the stone in exchange.

*Mr. W. Rathbone.*—Foley's statue of the late Mr. W. Rathbone, of Liverpool, the full-sized model for which was completed prior to the decease of the artist, has been erected in Euston Park, and will be unveiled on Monday, the 1st of January next.

*Wanton Outrage on Lord Derby's Statue at Preston.*—At the Preston Police-court, on the 19th inst., James Roberts, insurance clerk, and James Dobson, stationer's assistant, were charged with maliciously damaging, on the 13th inst., the Lancashire memorial statue of the late Lord Derby, by daubing the semblance of a garter under each knee, and a broad ribbon across the breast, with blue paint. Dobson had confided the secret of the "lark," as he called it, to a girl named Sarah Seward, and she imparted the information to Inspector Brown, and the prisoners were arrested. Both prisoners were committed for trial, heavy bail being accepted.

#### THE PORTICO OF ST. MARTIN'S IN THE FIELDS.

At a meeting of the St. Martin's Vestry, on the 21st inst., a communication was received from the Metropolitan Board of Works, forwarding amended plan for dealing with St. Martin's Church, in relation to the proposed new street from Tottenham-court-road.

Mr. Churchwarden Scott said he totally disagreed with the proposed alteration. He did not think they had been quite fairly treated by the Metropolitan Board, who should have informed them long since of their intention to interfere with the church, instead of surprising them with their plan, and in not accepting the modified plan submitted by the Vestry at the request of the Board. He thought the proper course for the Vestry to take would be to stand against any alteration of the church whatever, and in that course he was sure they would receive the support of the parishioners.

Mr. Soame was of opinion that the course recommended by Mr. Scott would not be the most efficient one. The Vestry should, instead, try to aid the Board of Works to obtain a plan that would carry out the improvement of the thoroughfare and injure the church as little as possible. For his part, he did not see the necessity for the steps in front of the portico, to maintain the beauty of the church.

The Chairman (the vicar) said the question under discussion did not concern the parish alone, but the public, and as the church was one of the ornaments of the metropolis, they were responsible to the public for its maintenance in its original beauty. All the people to whom he had spoken had expressed their regret at the intention to interfere with it. He was sure the portico could not be touched without being injured. It was only the great importance of the improvement proposed by the Metropolitan Board of Works induced him to listen to any such proposal.

The further consideration of the matter was postponed.

#### ST. WERBURGH'S TOWER, BRISTOL.

It will be known to the readers of *the Builder* that the Corporation of Bristol some time ago decided to pull down St. Werburgh's Church, ostensibly on the ground that it stands in the way of certain street improvements. A strong feeling grew up in favour of retaining the tower, one of the oldest and most ornamental in the city, and the question came before the Town Council the other day as to whether the tower also should be pulled down or allowed to stand. A resolution in favour of retaining the tower was moved by Mr. G. Wills, and seconded by Mr. T. T. Taylor. After some discussion, the resolution was rejected by 30 votes to 23.

Well may the *Bristol Times and Mirror* observe that it would hardly care to have strangers estimate the culture and taste of Bristol and Bristolians from this resolution to pull down the tower of an old historic city church. "The decision of the Town Council leaves nothing for hope or fear, as after the 31st of the present month,—this, we presume, being thought a suitable way to inaugurate the new year,—pickaxes and shovels will begin the work of demolition upon the sacred building, it being decided that the tower, too, is to come down; and perhaps it is best for us and for our own character as a city, that since an ancient historic church in the centre of the city should be destroyed, to widen a street, no trace of our Vandalic disposition should remain. Not that we think either the Town Council or the inhabitants of Bristol are the parties chiefly accountable for the business. To put the saddle on the right horse, we are bound to agree with Mr. Wills when he said 'The churchwardens and vestry are the Goths on this occasion.' But for them, and the patron, and the parson, St. Werburgh's would continue to stand."

It may be noted that Mr. Josiah Thomas, city surveyor, reported (1) that the cost of restoring the tower would be about 1,500*l.*; (2) that the annual cost of repair and maintenance after such restoration would for many years be a nominal sum, say 10*l.* per annum; (3) that the value of the land actually occupied by the tower, calculated at the same rate as agreed to be paid for the whole site, is about 560*l.*

#### ARCHÆOLOGICAL SOCIETIES.

*Chester.*—At the usual monthly meeting of the Chester Archæological Society, held on the 4th inst., Mr. Thomas Hughes, F.S.A., read a paper by Dr. Kendrick, of Warrington, on the Roman remains discovered at Wilderspool, Cheshire, the supposed site of the Roman station of Condate. The site of the discovery of these remains forms a parallelogram of thirty-six statute acres in extent, and the whole of it is in process of removal for the excellent building sand which is below its surface. So early as the beginning of the present century the existence of Roman remains here was discovered on carrying the Old Quay Canal through the site, but it is only since 1863 that the excavation of the whole property has been determined on, and gradually proceeded with. The precise site occupied by the Roman station was until recently known as the Town Field.

*Cumberland and Westmorland.*—The winter session of the members of this society was held at Kendal on the 11th inst., Mr. Ferguson, M.P., in the chair. Mr. R. S. Ferguson read the first paper, on Roman roads in Cumberland and Agricola's line of march to the Solway. Archdeacon Cooper read a short paper, by Canon Knowles, on Saxon crosses. The interlaced crosses Canon Knowles was inclined to consider Irish, and that they originated in wattle-work. The Rev. T. Lees said that theory was the best they could have, and was also held by Mr. Greenlow, and enunciated by him at Hexham. Mr. Jackson, St. Bees, contributed a paper on "Some Roman Remains," including a camp about a mile and a quarter from Bewaldeth, not far from Ireby and Bothel, which showed well-developed ramparts, and deep, well-preserved ditches. After dinner a *conversazione* was held, and a paper was read by Mr. G. E. Moser, on the "Kendal Parish Registers"; after which Mr. Bellasis read a contribution on "A Glimpse of Social Life at Kendal in the last Century." A meeting for business was held in the Kendal Museum on the following day.

*Berks.*—The annual *soirée* of the Berks Archæological and Architectural Association was held on the 29th ult., at Reading, Sir John Conroy presiding. Professor Rupert Jones having delivered a short address on some sepulchral remains found during the excavations made along the line of the Plumtree ditch for drainage purposes, Mr. James Parker gave an address on the Roman remains at Silchester, in course of which he incidentally remarked that there was a great tendency in the present day to the centralisation of architectural and archæological objects, which had been the greatest curse to those engaged in working out the history of the country. He did hope the time would come when Reading would have a museum, and that one great feature of that museum would be the Roman remains. Captain King, of Sandhurst, then delivered an interesting address on flint chips, implements, and weapons, illus-

trated with numerous specimens, some of which he had found at Bob's Mount, Katesgrove, and argued, amid applause, that a certain amount of centralisation in regard to archæological objects was advantageous for purposes of comparison.

#### THE MANUFACTURE OF STEEL.

At Leeds, the other evening, Mr. B. Walker, of the firm of Tannett, Walker, & Co., president at the annual dinner of the Leeds Foremen Engineers. In proposing "Prosperity to the Association," he referred to the processes of steel-making, stating that for the Bessemer process the iron must be free from phosphorus. The Middlesbrough iron contained from one to two per cent. of phosphorus. Steel could be made from this iron as from hematite iron, but would be unsound and rotten. Mr. L. Lowthian Bell, M.P., had said he had found out a process by which the phosphorus could be extracted; and he proposed to take Middlesbrough iron, or pig-iron made in Yorkshire, and put it into a Bessemer converter, and get rid of the silicon and phosphorus before running it into the puddling furnace. The phosphorus could not be got rid of in a puddling furnace; but puddling was very laborious and difficult work, and he (Mr. Walker) was quite sure that when the iron trade revived ironmasters would experience great difficulties from the want of puddlers. At least 5,000 puddlers had been turned away in the Middlesbrough district, and most of these had been absorbed in other occupations in other districts. This difficulty could be avoided by using nothing but hematite iron, because they could do away with puddling by the Bessemer process. If hematite iron were to rise very much in price, Mr. Bell's process would become a valuable one; but so long as there was only 1*l.* or 30*s.* difference in price between the two classes of iron it would scarcely pay to adopt Mr. Bell's extra process. The Bessemer process was undoubtedly the simplest of all for doing away with puddling, and all that was required was iron free from phosphorus and sulphur. A good deal had been said about Belgium and America being likely to run this country a very close race in the manufacture of iron and steel. He was thoroughly convinced that, so far as the manufacture of pig-iron was concerned, it would be very difficult for any country to beat us. He thought there was considerable improvement to be made in the manufacture of wrought iron, and the furnaces, as a rule, consumed far too much coal. Still we could make bar iron more cheaply than any other country. A good trade could be done with America if only the tariff were taken off. The Americans were quite wrong in maintaining the new tariff, which was the protection of a few to the injury of the many. With regard to the saving of coal, he was convinced that if the whole of the steam-engines in use were to be thrown on the scrap-heap and replaced by new ones, a saving of 10 per cent. on the outlay could be effected. The saving of coal, so far as steam-engines were concerned, was to be effected by having high pressures, and that meant better boilers.

#### ORGANS.

*Gloucester Cathedral.*—A Gloucester paper says:—"Eight or ten years ago, when the restoration of the cathedral was under consideration, it was suggested that what has been aptly termed 'the absurd screen,' erected by Bishop Benson at the entrance to the choir, and the organ which stands upon it, should be removed. The proposal did not, we believe, at that time find much favour with Sir Gilbert Scott and some of the authorities, while the late Dr. Wesley was strongly opposed to the views of those who have elsewhere been termed 'the vista theorists' in reference to cathedral restoration." The same paper states that on the 29th ult. Sir Gilbert Scott, accompanied by Mr. Waller, the resident architect to the chapter, minutely examined the screen and organ, and as the result they recommended to the chapter, at their meeting on the following day, that the screen should be taken down, the organ placed in the north transept, and other incidental alterations made in the internal arrangements.

*Lincoln.*—The organ of St. Martin's Church, Lincoln, has been enlarged and removed from an unsightly position in the body of the church: Mr. James Waller, painter, is, at his own cost, decorating the metal pipes of the organ.

*Sherborne Abbey.*—The grand organ of Sher-



**Born Abbey** has been re-opened, after undergoing repairs and additions by the makers, Messrs. Gray & Davison. The chief additions to the instrument have been an enlargement of the swell and the addition of a sweet stop,—the harmonic flute.

**Hebden Bridge.**—A new organ has just been placed in St. James's Church, Hebden Bridge. Dr. W. Thomas is the generous donor of the instrument, which has been built by Messrs. Foster & Andrews, of Hull. It occupies a position near the choir, and its case was designed by Mr. R. Norman Shaw, A.R.A., the architect of the chancel.

#### DISPUTES WITH WATERWORKS CONTRACTORS.

**Dundee.**—The Dundee Courier understands that an action has been raised by the contractors (Messrs. Eddington & Co. and D. Y. Stewart & Co.) against the Water Commissioners, for upwards of £2,000, for extra work in connexion with the construction of the Lintrathen waterworks. The commissioners, at a meeting on the 5th inst., agreed to ask the contractors to a conference, with the view of coming to a satisfactory settlement if possible. The serving of a summons to the above effect has been the answer. At a subsequent meeting of the water committee it was considered advisable to hold the conference still, if that could be accomplished, previous to adopting legal proceedings.

**Warwick.**—At a meeting of the Warwick Town Council on the 12th inst., the clerk said he had received a letter, which he should not read if he acted, as he considered, wisely. The writer had, however, asked him to lay it before the council. The Mayor said he had better read it. The letter was as follows:—

"Milverton, Dec. 11th, 1876.

"Sir,—I have now gone through the accounts of the work done at Haseley with Mr. Pritchard, and the measurements have been agreed upon between us. Mr. Pritchard is prepared to give his final certificate, but declines to include therein a sum of 500*l.*, which was promised to me in addition to the scheduled prices. On the faith of that promise I proceeded with the works, which I should otherwise have discontinued, as I could not have undertaken to struggle with the difficulties of the job without some additional payment. I feel sure that when the whole matter is explained to the council, my claim to this sum of 500*l.* will be admitted, and I merely write this letter in order that it may not be supposed that I have, in agreeing to Mr. Pritchard's measurements, in any way withdrawn such claim. I shall be obliged if you will lay this letter before the council at their meeting to-morrow.—Yours faithfully,

"GEORGE F. SMITH."

The clerk said there was no promise of the sort. Alderman Glover thought the letter had better be laid before the waterworks committee before the cheque recommended by Mr. Pritchard was drawn. It was finally decided to lay the letter before the waterworks committee, the resolve to draw the cheque being adhered to.

#### LIGHT AND AIR CASES.

BARKER v. LINDSAY.

THIS was a motion in the Chancery Division, before Sir R. Malins, made on behalf of Mr. W. R. Barker to restrain Sir Coutts Lindsay, bart., from raising the walls and roof of the Grosvenor Gallery, New Bond-street, to such a height as to deprive the plaintiff of light and air.

The plaintiff represented the chemists, Messrs. Savory & Moore, 143, New Bond-street, and stated that the house with regard to which the injury was complained of was used by them for the preparation of chemicals, and was especially convenient to them on account of its being close at the back of their shop; their landlord was Sir Coutts Lindsay, and they had a lease of six years.

Mr. Bristowe, Q.C., and Mr. T. A. Roberts, appeared for the plaintiff, and Mr. John Pearson, Q.C., and Mr. Watson, for the defendant.

The Vice-Chancellor ordered that the defendant might roof in the gallery at the present height of the walls upon his undertaking to remove the roof and lower the walls so far as the Court should direct at the hearing of the cause.

**A Lighthouse Washed Away.**—Coatham was visited by a severe gale on the 21st inst. The pier has suffered severely, the whole of its "head," upon which has recently been built a lighthouse, and more than 290 yards of the promenade, were completely washed away, and the debris lies scattered on the beach between the Victoria Hotel and Tees mouth. About two years ago the pier was cut into three distinct pieces by two ships going through during a very heavy gale, and it was only repaired about a year ago at a large outlay. When perfect, it was one of the longest promenade piers on the coast; it extended 2,500 ft. into the sea.

#### THE NATIONAL OLYMPIAN FESTIVAL.

President ..... Vice-President .....  
Council .....

It is proposed that an annual festival, under the above title, shall be instituted for the purpose of centralising the various associations having for their objects the encouragement of intellectual and of athletic contests, as, for instance, the Eistedvods of Wales, and the athletic associations throughout the kingdom, in order that by the establishment of such a festival, both the intellectual and physical contest may be brought into the same arena, and that the public may be impressed with the important truth that the *mens sana in corpore sano* consists in the development and maintenance of a due proportion or balance between mind and body. This festival would be founded on the same principle, and with the same objects as the Olympic Games.

Prizes will be offered for essays, poems, musical compositions, choral singing, &c.; and for success in the various kinds of athletic games. But the highest prize will be awarded to him who shall exhibit the largest general power.

It is further proposed that the Crystal Palace at Sydenham shall be the place where the Annual Olympian Festival shall be held, not only on account of the extent of the Palace grounds, but that the festival shall be identified with the Palace, and be made to contribute to its financial success and preservation.

W. CAVE THOMAS.

#### CONCRETE ROOFS.

SIR,—I have read in your paper of the 16th inst. a report of the proceedings of the Architectural Association at a meeting held on the 8th inst., at which an interesting paper was read by Mr. H. H. Statham, "On the Architectural Treatment of the Roof." Mr. Statham condemns every known material used for roofs as perishable and out of character with the sub-structure, and points to a something which will eventually answer all the requirements of "a glorified roof." He finally winds up by saying, "It may be suggested that concrete, even if it, does not attract much as a material for walls, may have a part to play for roofing." Although not a member of the honourable profession to which Mr. Statham belongs, I take the liberty to observe that far away in the wilds of Kerry an experiment has been tried which, as a first attempt, has proved remarkably successful. A cottage 24 ft. by 16 ft. has been roofed with concrete, the shape being segmental, the cord of the arc being 14 ft. and the height to the roof 14 in., the thickness of concrete being 8 in. at springing and 4 in. at crown. The proportions used were one of cement to three of well-washed sand and gravel.

An engineer who examined it expressed his belief that this roof would sustain the Kerry regiment if it could be crammed into so small a space!

ROBT. W. CLURE.

#### EXTINCTION OF FIRES.

SIR,—Your correspondent "R. T." appears to have overlooked one or two trifling considerations in his arrangements for extinguishing fires. Taking into consideration the fact that the majority of fires are occasioned by carelessness in people who are retiring for the night, and that such fires usually occur in rooms where the inmates are most likely asleep, it appears to me more than probable that not only the fire, but the sleeper as well, would be extinguished.

In addition, if "R. T." bears in mind that carbonic acid gas is a heavy fluid, and as such very slow in its movements, I am more than inclined to suspect that before a sufficient quantity of the fluid had found its way through the "pin-hole," or even through a much larger orifice, the whole of the damage would have been done, and the "extincter" would arrive, like the proverbial policeman, after the mischief was perpetrated.

I grant that in some classes of buildings, such as large warehouses, it might possibly be useful, but from the fact that every one must at once vacate the premises and close every orifice, even to the exclusion of that best of all fire extinguishers, the fire brigade,—its value must certainly be of a very tentative character, as the accidental omission to close a window or door or chimney-shaft, would undo the whole.

W. JACQUES.

#### THE POOR AT THE VESTRY-HALL.

SIR,—In your last week's paper you published a report by Dr. Tidy, the health officer of Islington. I cannot wholly agree with his statements, as I find from my own experience that when the poor apply at the vestry-hall to have existing nuisances removed they are sometimes treated in a very off-hand manner, and have to apply more than once. I think if the poor were treated with a little more respect when they make complaints, and the sanitary officers did their duty better, we should find a wonderful improvement in the sanitary state of the homes of the poor.

ONE OF THE POOR.

#### "SCARCITY OF COTTAGES IN IPSWICH."

SIR,—You were kind enough to notice favourably, on its first introduction, my patent "Concrete Slab Cottage," and you also reported a discussion at the Royal Institute of British Architects, where I expressed my opinion that I should succeed in producing a good four-roomed house for 100*l.* I know you will be glad to hear I have succeeded, and that I am making arrangements to manufacture them of a large scale. I hope to commence the supply about next June, and did not intend making the matter public till then, but your memo., headed as above, seems so exactly to meet the case that I have forestalled the matter a little, as I know many people besides yourself are most anxiously looking for a solution of the problem.

W. H. ISCELLES.

#### A CENTRAL PARK FOR LONDON.

SIR,—The desirability of a large central area for recreation in the heart of London is a matter which no one can question, and the idea has no doubt passed through the minds of hundreds of thousands of us, though there are difficulties in the way which at first seem insuperable. As regards expense, it would seem unfair to effect the object under consideration by tax upon the whole nation, whether direct or indirect; and to carry out the same by means of a general rate upon the metropolis would be conferring an especial benefit upon the patrons of it surrounding the central park at the expense of those living at more remote distances. At the same time, it would require contributions to so large an amount that no local district could be expected to stand the expense of purchasing property sufficient for anything that could be called a "park," and by a park I mean not an expanded square of about 20 acres, but one of at least 160 acres, if not 320 acres. I would suggest that a committee be formed, called the Central Park Association, who should meet periodically, receive voluntary subscriptions, grants, and legacies, with a view of purchasing and clearing land as near as possible, if not wholly or partly in, the East or West Central districts,—the clearing to be enlarged gradually as funds accumulate. Some of the land adjoining the new street from Bloomsbury to Shoreditch would be as advantageous a site as I can think of; and if the matter were to be taken up energetically few contributors but might live to see the idea properly carried out.

WALTER SCARGILL.

#### ACCIDENTS.

ON the 18th inst., two houses which have been recently erected in Stockwell-green, fell down with a crash into the footpath and road, and many workmen and others narrowly escaped with their lives. A number of plasterers, slaters, and others had been employed at the houses, but fortunately had left work for dinner when the two houses fell to the ground. The whole of Stockwell-green is now built over. At the meeting of the Metropolitan Board of Works on the 22nd inst., Mr. Fowler moved "That it be referred to the Building Act Committee to consider and report as to an amendment of the Section 98 of the 25 & 26 Vict., c. 102, and that the solicitor do report to the committee thereon." Mr. Fowler said he should propose a resolution that Mr. Vulliamy be instructed to report upon two houses which had recently fallen at Stockwell-green; and also that his attention be directed to other houses which were in a dangerous condition. These houses had collapsed in consequence of the inefficient manner in which they had been constructed. Fortunately there had been no loss of human life, but it was a very disgraceful thing that such buildings should exist. The resolution was carried unanimously. More recently a third house has fallen at the same place.

On the 20th inst., a frightful scaffold accident, which it is feared will terminate fatally, occurred at the new buildings belonging to Mr. Doulton, High-street, Lambeth. It appears a number of bricklayers and labourers were engaged on the scaffolding, when a man named William Abrahams pitched head foremost over the scaffolding, and fell a distance of 40 ft. In his descent he struck against the transverse poles, and on his being removed to St. Thomas's hospital it was found that he had sustained a compound fracture of the right leg, a fractured jaw, and serious internal injuries.

On the 13th inst. an old stable, at St. John's, Worcester, fell bodily into the street. A young girl was buried in the ruins. She was got out fearfully injured, and at once conveyed to the infirmary, where it was found necessary to amputate one of her legs. It seems the building has been for a long time in a dilapidated condition. Who is to blame for leaving it to fall?

#### The Proposed Museums on the Victoria Embankment.

At the last meetings of the Chambers of Commerce of Liverpool and of Exeter it was unanimously resolved to memorialise her Majesty's Government in favour of the establishment on the old Fife House site on the Victoria Embankment of the proposed India and Colonial Museums.



## CHURCH-BUILDING NEWS.

**Banbury.**—The works of improvement and decoration which were commenced in the parish church, Banbury, about twelve years ago, have lately been brought to a conclusion by the completion of Mr. Blomfield's original design. The interior of the chancel has (according to the *Banbury Guardian*) been entirely remodelled, and now finishes with an apse and semi-dome, the composite order of the church, with its entablature, being carried all round. This alteration involved the construction of a complete new shell, contained within the old external walls, the removal of the old chancel arch, and a new roof connected with that of the nave. The choir has been brought out into the nave, and surmounted by a low stone and marble wall, according to the basilican arrangement. The choir-stalls are of oak, handsomely carved, in an appropriate style. The whole of this work has been carried out by Messrs. Davis, Brothers, of Banbury. The tessellated pavement is by Messrs. Godwin, of Lugwardine. A font in white marble, with coloured inlays, has been presented to the church by the sister of the vicar. Mr. Blomfield's design for the font was carried out by Mr. Alfred Claridge, of Banbury. The coloured decorations have been executed under the architect's superintendence by Messrs. Heaton, Butler, & Bayne, of London. The semi-dome is occupied by a large painting illustrating the description given in Rev. iv., of our Lord enthroned in majesty. The central figure is surrounded by an emerald rainbow, while the four-and-twenty elders appear at His feet, with the signs of the four Evangelists at their sides, and the seven lamps. Below the subject is the text which it represents. The wall of the apse is divided into three spaces in which are introduced life-sized figures of the twelve Apostles on a gold ground, with Scriptural trees represented behind them. The pilasters are decorated with gold flutings, and the capitals are gilt. The organ, which is now placed in a chamber on the north, has been entirely reconstructed by Messrs. J. W. Walker & Sons, of London. The new carved oak case was made from the architect's design by Messrs. Rattee & Kett, of Cambridge.

**Hethersgill.**—The new Church of St. Mary, Hethersgill, Cumberland, was consecrated on the 14th inst., by the Bishop of Carlisle. It is intended as a chapel-of-ease to Kirkcubbin, and has been erected from the designs of Messrs. Habershon & Brock, of London, which were selected in competition. It is built in the Early English style of local red sandstone, with lancet-pointed lights of clear glass; a wheel window in the west gable, mullioned and of stained glass; and a memorial window in the east gable, consisting of three lights, bearing designs representing the Annunciation, the Nativity, the Adoration of the Magi, the Departure into Egypt, the Crucifixion, and the Ascension. The window was designed by Mr. John Scott, of Carlisle, and put in by Mr. Graham, of Hawksdale. The church is seated for about 200 people. The fittings are all of yellow pine, stained and varnished. Messrs. C. & J. S. Armstrong, of Carlisle, were the builders, the contract sum being 1,300*l*.

**Salisbury.**—Fisherton Church, Salisbury, was re-opened on the 6th inst., after the erection of a new north aisle. The work has been executed at a cost of nearly 2,000*l*, and has been in hand about seven months, the architect being Mr. T. H. Wyatt, diocesan architect; the builders, Messrs. Hale & Co., of Salisbury; and the clerk of the works, Mr. F. W. Mansel. Before the erection of the north aisle the roof of the church was rather weak, but by means of this addition it has become considerably strengthened. By the alterations 200 additional sittings have been obtained, accommodation now being afforded for 850. In the north aisle there are eight windows, six at the side and one at each end, and the necessary heat is supplied by Diplock's heating apparatus.

**Almondbury.**—Almondbury parish church, which has been undergoing restoration for the last five years, was completely re-opened on the 27th ult. The nave was re-opened on March 24th, 1874. The galleries and organ-loft, which rendered it dark, have been removed, and the tower is opened as a baptistery. The spacious chancels and side chapels were separated from the church by temporary walls, and the service was conducted in the nave alone, the whole of which area was furnished with oak seats and desks, mats, and hassocks. Up to this time 4,000*l* had been expended. The work of restoration was

resumed in autumn, 1875. The chancel and side chapels, belonging to the Kaye family, represented by the Earl of Dartmouth, and the Beaumonts, of Whiteley and Bretton, have been extended by the addition of two memorial chapels. At the east end of the church are three stained-glass windows, the gift of Sir John Wm. Ramsden, bart., representing the Crucifixion, the Agony, and the Resurrection. The whole of the expense of the chancel with its oak roof, tessellated pavement, gas standards, oak stalls, and two new arches, has been defrayed by Sir John William Ramsden, about 1,000*l*. The Kaye Chapel has been restored by the Earl of Dartmouth, at a cost of 400*l*; and the South Chapel by contributions, 100*l*. The external sculpture is not yet complete. Pinnacles, gurgoyles, and bosses are being added. The total cost will be above 7,000*l*.

**Bedford.**—The committee appointed to receive tenders for the enlargement of St. Cuthbert's Church, Bedford, have decided to accept the tender of Mr. Foster, of Kempston, which was the lowest sent in, being 1,180*l*.

**Warthill.**—Warthill Church, near York, has been re-opened, after having been almost entirely re-built through the munificence of Mrs. and Miss Agar, of Brockfield. The late church was barnlike in appearance, and hemmed in by dilapidated cottages. The cottages have been removed, the churchyard enlarged, and thrown open to the road and fenced by a palisading of ornamental ironwork. The church is of brick with stone facings. On the south side of the nave there is the tower, which now contains a peal of three bells. The nave is seated with open benches, and the chancel with oak stalls. The pulpit and lectern are of oak, carved. There is a handsome reredos, designed and painted by Miss Agar. The new church has been built in the Early Decorated style, from the designs of Mr. J. G. Hall, of Canterbury, architect. The whole of the masons' work has been carried out by Mr. Clark, of Barker-hill; the joiners' and all timber work by Mr. Rookledge, of Little Stonegate, York; the bricklaying by Mr. J. Nichols, of Dunnington; and the glazing and coloured glass by Mr. Hodgson, of York. The bells were supplied by Messrs. Warner & Sons, of London.

**Clare.**—It has been determined to restore the fine parish church of Clare, Suffolk. The work of restoration has been intrusted to Mr. J. P. St. Aubyn, architect, and will be carried out by degrees as the funds will permit, the committee having decided not to incur any heavy debt, and to do thoroughly whatever they undertake.

**Arminghall.**—The ancient church of Arminghall, near Norwich was re-opened on the 5th inst., having undergone restoration. In June last the work was commenced by the contractors, Messrs. Cornish & Gaymer, of North Walsham. The restoration consists of entirely new external walls of flint, with stone dressings, a pine roof, an oak screen, benches of oak in the chancel, and red-wood deal in the nave (the old oak poppy-heads being utilised for the former), new windows glazed with cathedral glass, fittings for lighting the church with the patent "Alpha" gas, and a flooring of Minton's tiles. The tower has also been renovated and its windows are repaired. The restoration has been carried out from designs prepared by Mr. J. P. Seddon. The total cost has been about 920*l*.

**Stourport.**—It was decided, at a meeting held at the Town-hall on the 14th inst., to request the churchwardens to raise 470*l* by a voluntary rate, for the purpose of carrying out Mr. Meredith's plans for improvements of the parish church.

**Tudely.**—All Saints' Church, Tudely, near Tonbridge, has recently undergone a partial restoration. Of the original church little remains, it having been mainly rebuilt, about eighty years since, of brick, with windows, seats, &c., of the wretched description usual at that period. The style selected by the architect for the present restoration was Late Decorated, to suit that of the few remains of old work which were of that date. The original church had only nave and chancel, but in order to gain extra accommodation to make up for the loss of seats entailed by the destruction of the hideous gallery, a new aisle, with three arches between it and the nave, has been added on the north side of the church. The church now accommodates about 300, and, with chairs, may be made to hold many more. The choir seats are of pitch pine, those of the nave and aisle together, with the aisle roof being of red deal. The altar and lectern are of oak, made from designs of the architect. One of the

south chancel windows is filled with stained glass by Clayton & Bell. The south porch has been rebuilt, with the exception of the roof, and the spire covered with red tiles instead of shingle. The total cost of the restoration has been 900*l*, and the work has been carried out by Messrs. Talby & Son, of Tadely, from the designs and under the superintendence of Mr. R. Medley Fulford, architect, Exeter.

## DISSENTING CHURCH BUILDING NEWS.

**Haverstock-hill.**—A lecture-hall, which is intended as an adjunct to a new Presbyterian church on the slope of Haverstock-hill, was opened on the 19th ult. by the Presbyterian congregation formerly worshipping at the old church in Oxendon street, Haymarket. This long-established church was founded by Richard Baxter, in the year 1676, and he was the first minister. In January last the bi-centenary was observed in the old church, near Leicester-square, and soon afterwards the congregation came to a resolution to dispose of the freehold site and building, the latter having become entirely unsuitable as a modern place of worship. The lecture-hall is to be used temporarily for public worship, pending the building of the new church; is in the Gothic style, from a design by Mr. Arnold, of Basinghall-street, architect; and has been built by Messrs. Manley & Rogers, at a cost of about 1,300*l*. The hall will seat 260 persons, but under pressure will probably accommodate 300.

**Felling.**—On the 22nd ult. a new chapel for the Methodist New Connexion was opened in Wellington-street, Felling. The chapel is built of freestone, in the Early English style. The interior is 48 ft. long, 30 ft. wide, and 21 ft. 6 in. high, and will accommodate about 300 persons. There is also a schoolroom behind the chapel to accommodate 120 children. The whole of the joiner work is executed in American yellow pitch-pine. There is also a vestry, &c., attached to the buildings near the north-east corner. The following were the contractors:—Messrs. Robinson & Steele, mason work; Messrs. Gresson & Stockdale, carpentry and joiner work, and other fittings; Thomas Hale, plaster work; John Alder, cement work; W. Birnie, plumbing; and G. E. Almond, painting and glazing, all of Gateshead. The buildings have been erected from the designs of the architect, Mr. R. Pots de Redder, of South Shields. The cost, exclusive of land, was 1,900*l*.

**Sankey Bridges.**—The new Wesleyan Chapel at Sankey Bridges, near Warrington, was opened on the 23rd ult. The building has been erected by Messrs. Wallington, builders, Warrington, and will accommodate from 200 to 250 people.

**Frodsham.**—The foundation-stone of a new Primitive Methodist Chapel has been laid at Frodsham. The site of the new chapel is at the lower end of Main-street, and when completed the building will accommodate 200 persons, and is estimated to cost 700*l*, the contractor being Mr. Davies, of Frodsham.

**Horbury.**—On the 23rd ult. a new Primitive Methodist Chapel was opened at Horbury. The building occupies the site on which the old chapel formerly stood, but, being of much larger dimensions, it has been necessary to take in other land, both on the east and south, in order to carry out the plans of the architects, Messrs. Kirk & Sons, of Dewsbury. The new chapel will accommodate 600 worshippers, as compared with 250 in the old chapel. It is built of stone. The total cost has been 2,000*l*. The contracts have been carried out by Messrs. Tolson & Mercer, masons, Ossett; Messrs. Gibson & Maude, joiners, Ossett; Mr. Exley, plasterer, Horbury; Mr. Coates, plumber and glazier, Dewsbury; Mr. Walker, painter, Idle; Mr. Wright, slater, Dewsbury.

**Woodhouse.**—It has been decided to erect a new Wesleyan Methodist chapel at Woodhouse, near Rotherham, at an estimated cost of 2,500*l*. Mr. Webster, of Sheffield, will be the architect.

**High Easter.**—The Congregational chapel at High Easter was re-opened on the 28th ult., after renovation. The building was erected thirty years ago, but the work seems to have been badly done, for it has ever since been a trouble and expense to the worshippers. Mr. Partwee, architect, of Chelmsford, was requested to inspect the building, and on his advice a contract was entered into with Mr. Fincham, of Chelmsford, to execute the necessary works for 330*l*. The floor has been restored and raised, and the place reseated uniformly throughout.

**Dundee.**—A new Free Church is in course of erection in the Annfield-road, Dundee, for the



congregation at present worshipping in Hawkhill Free Church. The church will have sitting accommodation for 1,000 persons. Besides the church there will be two halls on the ground-floor, which will hold about 400 and 170 respectively. In connexion with these there will also be the officer's house, session-house, vestry, &c. On the gable to Annfield-road will be a spire about 100 ft. in height. The cost of the whole erection will amount to about 5,000l. The architect of the building is Mr. Alexander Petrie, of Glasgow. The following are the contractors:—Alexander Duncan, mason; Garvie & Farquharson, joiners; Robert Murray, glazier; Andrew Butter, slater; Alfred Guthrie, plasterer; David Brown, plumber.

**Glasgow.**—The congregation which has occupied the Regent-place United Presbyterian Church, Blackfriars-street, Glasgow, will require shortly to remove, in consequence of the extensive railway operations in that locality. It is stated that the price obtained for the present church from the railway company is 12,665l. The Dean of Guild Court has approved the plans for the new church. The style is Italian, with a square tower, from designs by Messrs. H. & D. Barclay, architects. The estimated cost of the structure and site will be about 11,000l.

**Handsworth.**—The new Swedenborgian church in Wretham-road, Handsworth, has been opened. The church has been designed by Mr. Thomas Naden. It has a stone front, with tower and spire, being built of hard red stone with Bath stone dressings, and in the Decorated Gothic style. The plan consists of nave, aisles, and chancel. Accommodation is provided for 600 persons. The cost of the building alone is over 500l. The pulpit and font are of stone, and have been executed by Mr. John Roddis, of Birmingham. The whole of the gas-fittings have been executed by Messrs. Winsford & Co. The entire cost of casing the front of the church with Hamstead stone was borne by Mr. Bloor, the builder.

#### ROMAN CATHOLIC CHURCH-BUILDING NEWS.

**Newton-Stewart.**—The new Roman Catholic church of Our Lady and St. Ninian, Newton-stewart, was formally opened on the 7th inst. The belfry, rising 3 ft. above the ridge of the building, is divided by two openings for bells, with a carved and polished medallion, above which, in the filling in below the main arch, is a deep cinque-foil opening. In the gables north and south are two large wheel-windows,—the one behind the altar filled in with stained glass, and forming a cinquefoil window; the other filled in with stained tracery, forming three trefoils. The other windows are lancet-shaped. The nave of the church measures 26 ft. by 26 ft. The flooring is of encaustic tiles laid on boarding. The roof is of open woodwork. The walls are lined 3 ft. 6 in. high round and round, and finished with the best plaster up to the eaves. The apices of the gables are finished with ornamental terminals from M<sup>r</sup> Farlane's Saracen andry, Glasgow. The architects are Messrs. R. Ingram, Glasgow; and the contractors, Messrs. Wallace & Morgan, Coatbridge.

**Clifton.**—Considerable extensions to the cathedral at Clifton are in progress, and the first portion having been completed, was opened on the 30th ult. This portion may be divided into three parts,—first, the school; second, the gym; and, third, the façade of the cathedral. The former is 69 ft. long, 32 ft. wide, and 30 ft. high, exclusive of a recessed gallery at one end; the latter is a platform or stage at the opposite end of the gallery, raised about 3 ft. The floor-space of the gallery, independent of the platform, will accommodate 550, or, with the platform, 600. It is intended to carry out the remainder of the work, and plans have already been prepared by Messrs. Hansom, at the Bishop's request, for commencing the work on the site of the present building. The plan shows a corridor on the outside, communicating with the atrium at one end and the apse at the other. Outside of this corridor is a massive campanile or bell-tower, 20 ft. square at the base, 100 ft. high, the lower part of which will be a noble baptistery, communicating by arches with the church. Farther along the corridor is a projecting chapel with semicircular apex, and arched opening from the apse. The present windows will be done with, and a series of semicircular-headed windows will be formed in the upper part of the wall, above the roof of the corridor, as a story, three windows in each bay. The

circular pillars will be cut into square pilasters, and a projecting cornice and parapet will be formed above the windows by means of stone corbels built in between the windows. Internally the bays are divided by pilasters and carved capitals, and under the window there will be a wide space for paintings or sculpture. The works have been carried out by Messrs. Wilkins & Sons, builders, of Bristol, from the designs and under the superintendence of the architect, Mr. Charles F. Hansom.

**St. Helen's.**—Arrangements are in progress for the erection of a new Roman Catholic Church for St. Helen's. The total cost of the building, plans for which have been prepared by Mr. Pagin, of London, is estimated at about 6,000l.

**Bury St. Edmund's.**—St. Edmund's Roman Catholic Church has been re-opened, after re-decoration. The building, which was erected forty years ago, is Classic in character, and the decorations have been designed and carried out in accordance with that style, by Mr. Robert Park, of Preston, Lancashire.

#### BELLS.

**Sandwich.**—Messrs. Gent, of Sandwich, have lately been engaged in repairing the bells of the old town, the "Curfew Bell" of St. Peter's having had new gudgeons attached thereto. The bell of St. Mary's having got cracked, has been replaced by a new one. The one at St. Clement's is also undergoing some alteration.

**Rotherham.**—The bells of the parish church, Rotherham, have been re-hung by Messrs. Mears, of Whitechapel, London, at a cost of 170l.

**Otley.**—The church bells at Otley have been re-hung by Messrs. G. Day & Son, of Eye, Suffolk, at a cost of 56l. The bells are of various dates, and are all of them as sound as when they left their founders' hands. The tenor bell (weight, 11 cwt.; diameter, 13½ in.; note, G sharp), was cast by Stephen Tonni, of Bury St. Edmund's; it bears the date 1576, and is, therefore, exactly 300 years old. The second, third, and fourth bells are of still earlier date, and bear old Latin inscriptions of the pre-Reformation type. The second is probably the oldest bell in the tower, and, like the tenor, was cast at Bury. The third and fourth bear the shields, which are the mark of a Norwich foundry. The treble bell, cast by Pheps, of London, was presented to the church in 1728 by a Mr. Russell.

**Shrewsbury.**—Mr. David Davies, an enthusiastic campanologist, lately delivered a lecture on "The Bells of Shrewsbury," in aid of a fund for supplying the deficiency which exists in the peal of bells at the Abbey Church through one of the number being cracked. In the course of his remarks, Mr. Davies adduced a great deal of interesting information. From the parish books he read the following, amongst other entries:—"At an assembly of the parish of the Holy Cross and St. Giles, upon the 7th of October, 1673, ordered—That the great bell, called by the name of St. Wenefrede's bell (or the greatest of the five old bells), be taken down, broken, and converted for the use of the parish church, in consideration of the great want of money for the supplying of the work now in hand, which is the making of eight new bells in the said church. (p. 345)." St. Wenefrede's bell was said to be 35 cwt. by one account, and 30 cwt. by another, and was famed for its deep musical tone. A complete peal of bells was cast for the Abbey tower in 1673. Six of these bells had been recast or re-placed since that date, and some of them more than once. The newest bell in the tower was the fifth, which was cast thirty years ago, and bore this inscription,—“Come when I call, to serve God all.” The old fifth was cracked on Sunday, the 1st of November, 1840, in ringing for the Rev. Edward Bickersteth (now Dean of Lichfield) and his bride, who had just returned from their wedding tour. The treble and second bells were cast fifty-one years ago, the old bells being flat and ill-tuned. The fourth bell was cast sixty-four years ago, the old one having been cracked in ringing for the election of 1807, when the Hon. William Hill and Mr. Thomas Jones were elected members of Parliament. The eighth, or tenor, bell, was cast 163 years ago, by Abraham Rudhall, of Gloucester; and the sixth in 1745 by Abel, his son. This bell and the tenor bell were admitted on all hands to be the best in the tower; and so great a favourite was the sixth, that some people hazarded the statement that for its weight it was not to be surpassed for fineness of tone by

any bell in any tower in England. The motto on the sixth bell was,—“Prosperity to the Church of England;” on the tenor,—“Religion and loyalty do make the best harmony.” The tenor bell was also re-cast 194 years ago,—that was thirty-one years before it was re-cast by Abraham Rudhall, and nine years after it was cast by Mr. Oldfield in the peal of eight,—by a Mr. Thomas Roberts, with additional metal. Mr. Davies now came to the “bell of the evening.” He was sorry it was cracked. He regretted it because those two fine-toned bells, the sixth and the tenor, could never be heard to advantage without a good seventh. He also regretted it because he believed few towns in England, if any of the same size, could boast of six such peals of bells as Shrewsbury. He thought it a little discreditable to the proud Salopians that they should have allowed one of the best peals of bells to have been incomplete and partially silent for over fourteen years. Moses Leigh was vicar of the parish when the bell was first hung in the tower, and he was one of the 2,000 clergymen who had been excluded from their livings under the Act of Uniformity. The companion bell to the seventh was the third, telling them—without a date—“G. Oldfield cast these eight.” There was an old king who employed an architect to build him a lighthouse, and ordered an inscription in honour of himself to be engraved thereon. The architect, however, coveted that honour for himself, and put the king's inscription on a plaster surface and his own name underneath on durable stone. The inscription on the third bell was like that in the durable stone on the lighthouse. Its sentiment was “I did it,” and there it would remain an abiding monument of the egotism of its founder. When its companion bells with their inscriptions had passed away, and when the seventh cracked bell with its date left the tower, they could say of it as Scott said of his last minstrel,—

“For well-a-day its date has fled,  
Its tuneful brethren all are dead.”

But if they judged Oldfield's egotism in that way it was only fair to measure his loyalty, too, by the same rule, and how much he loved his king let that seventh bell testify. Its inscription was “God save the King.” On the 9th of November, fourteen years ago, the Prince of Wales came of age, and the bells were expected to ring. The restoration of the church was in progress at that time, and either it was considered impracticable or unsafe to raise the bells or the sexton could not get ringers enough to ring them. The ropes, therefore, were tied to the bell tongues in order that they might be struck against the bell sides, as was done in ordinary chiming for church. To make the chiming, however, sound as much like ringing as possible, the ringers pulled at their ropes and nipped the bells,—as bell-ringers call it,—as lustily as they could. The old loyal seventh bell was the first to turn sulky under such merciless and ungrateful treatment. Somebody had been trying to mend the old bell. A great gap had been cut into it 14 in. deep and ½ in. wide. He admired the pluck and the patience of the operator. He fancied he could see the man at work and almost hear his very thoughts:

“Chip! Chip! Chip!  
Till I'm bother'd to death with the din.  
Chip! Chip! Chip!  
I feel awarin can't hardly be sin.  
Drill and chisel and rasp!  
Rasp and chisel and drill.  
But my solace I know when my bacca's aglow,  
And I awig till I get my fill.”

About the wisdom of the operation he would rather not express his opinion too plainly; but they could not tinker a fractured bell. It was beyond the power of

“All the king's horses  
And all the king's men.”

They could not bring it back to itself. They must have a new bell, and he trusted when it arrived at the tower the seventh would be a loyal bell still, and that when it struck its first note it would say “God save the Queen.”

**North of England Master Slaters' Association.**—The annual meeting of the above association was held on the 13th inst. at Durham. Mr. Wanless, of Darlington, the president, in the chair. The following gentlemen were elected office-bearers for 1877:—President, Mr. Roger Rule, Durham; vice-president, Mr. Dickenson, Newcastle; treasurer, Mr. Robertson, Sunderland; secretary, Mr. Place, jun., North Shields.



## THE BODLEIAN LIBRARY, OXFORD.

DURING the past year some extensive structural repairs have been commenced and partially carried out at the Bodleian Library. The exterior walls of the reading-room, which are considerably out of the Perpendicular, though, it is said, not more so than in Wren's days, have been trussed together by iron ties, and the whole of the flooring, which it appears rested somewhat dangerously upon the vaulting of the Divinity School below, has been raised a foot, diminishing (unfortunately, though necessarily) the height of the room to that extent. The old woodwork was found on examination to be extremely massive, and constructed so as to avoid all lateral thrust upon the outside walls. The internal fittings have of necessity been cleared away for these repairs, and a discussion has for some time been going on as to the propriety of restoring them, with or without modifications. The old book-cases, which form recessed reading compartments, or "dens," as they are familiarly called, are of so solid a framework, and are accused of taking up so much room and obstructing so much light and air, that a utilitarian party is for completely sweeping them away, and substituting an arrangement of ordinary reading-tables with modern appliances, such as those at the British Museum. The advice of Mr. Jackson, architect, has been called in, and there is some guarantee that no violent change will be made.

## ARCHÆOLOGICAL DISCOVERIES.

*Ancient Monumental Stones in Shetland.*—At the last meeting of the Society of Antiquaries of Scotland, a paper by Mr. G. Goudie was read, giving an account of the recent discovery of two monumental stones in Shetland, with inscriptions in the Ogham character, a species of cryptic writing characteristic of Early Celtic inscriptions. Only five such inscriptions are known on the mainland of Scotland, and five are now known in the island groups of Shetland and Orkney. One of the stones described by Mr. Goudie was found by him in the ancient burying-ground of St. Ninian's Isle, Dunrossness, and the other was dug up from under five or six feet of moss in Lunnasting, on the mainland of Shetland.

*The Ostrian Catacombs, Rome.*—A Daily News telegram from Rome states that an important archaeological discovery has just been made in the Ostrian Catacombs, two miles along the Via Nomentana. Signor Rossi had already established the spot as that where the Apostle Peter was wont to baptise, and where he first sat in the crypt of the subterranean chapel. Signor Armellini has succeeded in deciphering an inscription in which occurs the name of St. Peter, and which would seem to corroborate the previous conclusions as to the Apostle's connexion with the Ostrian catacombs.

## CAUTION.

SIR,—Allow me to put your readers on their guard. I find from two sources, where inquiry was thought prudent, that a young man calling himself Werner is going about to members of the profession asking aid, showing a letter purporting to be signed by me and saying I had told him to call.

He is quite unknown to me even by name. He has not been to me, nor have I ever given a begging letter of this sort. WILLIAM WHITE.  
Wimpole-street.

## SCHOOL BOARD SCHOOLS.

*Tudely.*—New school-buildings for the united district of Tudely-cum-Capel, Kent, have recently been erected by the Board. They are built of brick with Ham-hill stone dressings in the First Pointed style, the roofs (which are open on the inside) being covered with dun-coloured tiles. The buildings accommodate 114 boys, 83 girls, and 46 infants, there being a class-room for each of the two former, with porches, lavatories, &c., complete. The master's and mistress's residence stands in the centre of the block. The schools are fitted with Shillito & Shortland's Manchester school-grates. The desks are those patented by Mr. Wimpell, of Exeter. The total cost of the buildings, including desks, boundary-walls, &c., has been

1,957l. 7s. The works have been carried out by Mr. W. Magford, builder, of Exeter, from the designs of Mr. R. Medley Fulford, architect, also of Exeter.

*Great Sampford.*—The new Board school at Great Sampford, Essex, is nearly completed, and will be ready for opening with the new year. It has been erected by Messrs. Whiffen & Sons, of Saffron Walden, from designs by Mr. Charles Pertwee, architect, Chelmsford.

*Luton.*—New Board schools in Waller-street, Luton, were opened on the 27th ult. The schools, which will be the only boys' schools under the management of the Board in the town, occupy a good central position just opposite the Swimming Baths in Waller-street. The buildings have been erected at a total cost of about 2,250l., to accommodate 300 children. The roofs are open-timbered, stained and varnished. Mr. J. R. Brown was the architect, and Mr. A. Smart, the builder.

*Rotherhithe.*—New Board schools at Medway-place, Rotherhithe, have recently been opened by the School Board for London. The building has been erected to accommodate 276 boys, 271 girls, and 315 infants,—a total of 862. The area of the site is 25,609 square feet, and it cost 900l. net; the legal expenses making the total cost 1,084l. 8s. 1d. The contract for the building, taken by the late Mr. Thomas Ennor, was 8,884l., Mr. Robson's commission as architect and Mr. Carter's salary as clerk of the works making the cost of the building 8,986l. 15s. 8d., and the grand total of cost 10,071l. 3s. 9d., an average per head of 11l. 13s. 7d.

## MONUMENTAL.

*Constantinople.*—A monument to the late Lord Strangford, to be erected in the Memorial Church at Constantinople, has just been completed by Mr. Physick, sculptor, who received the commission from Lady Strangford. It is composed principally of dark crimson serpentine marbles, enriched with ornamental work in gilt relief.

*Welcombe.*—The large obelisk recently erected at Welcombe, near Stratford-on-Avon, by Mr. Robert M. Phillips, M.P. for Bury, at a cost of 7,000l., in memory of his late and only brother, Mr. Mark Phillips, who was the first representative of Manchester, has just received its inscription, which states that "On the passing of the Reform Bill he (Mr. Mark Phillips) was elected, in 1832, the first member for Manchester, and continued to represent that city for fifteen years."

*Ardelach.*—A monument to the memory of the late Rev. H. McLeod has just been erected in the picturesque churchyard at Ardelach. It is of red, sparkling, highly-polished granite from the Kinstearry (Nairnshire) Quarry, and was designed and executed by Messrs. D. & A. Davidson, sculptors, Inverness.

## STAINED GLASS.

*Dumbarton.*—A stained-glass window has just been placed in Dumbarton parish church. It is the second window from the east on the south side. It is described by a Scotch paper as being in the "Mosaic" style, and has been erected in memory of Mr. William Paterson, writer and bank agent, who died in 1875, leaving nearly 10,000l. to the church. The subject of the window is Christ's Sermon on the Mount, and underneath the picture is the beatitude. The window is from the works of Messrs. Keir, St. Vincent-street, Glasgow.

*Abbotsley.*—A stained-glass chancel window, of two-lights, has lately been erected in St. Margaret's Church, Abbotsley, to the memory of the late Bishop Douglas, of Bombay, formerly vicar of Abbotsley. The window, which is by Mr. Gibbs, and which was designed under the superintendence of Mr. Butterfield, represents our Lord's charge to St. Peter. It has been erected by the Bishop's former parishioners and friends at Abbotsley.

*Huntingdon.*—A new east window is being placed in St. Mary's Church, Huntingdon, the gift of the Ven. Archdeacon Vesey (archdeacon of Huntingdon). The tracery of the window is of Bath stone, with three lights, moulded jambs, rising from circular moulded bosses, with double annulets, marble columns (black), surmounted by beautiful moulded caps, moulded inner arches, with hood-moulds springing from carved bosses. The contractors for this work are Messrs. W. Balmer, builders, Huntingdon, and Mr. A. Wrighton, stone mason and carver, Godman-

chester. The window will be filled with stained glass.

*Shirburn.*—Several of the windows of the recently-restored parish church of Shirburn, near Watlington, have been filled with stained glass by Messrs. Ward & Hughes. The subject of the chancel windows is the Nativity: the Virgin and Child with St. Joseph in the background, are in the centre; while the Wise Men of the East occupy the right-hand light, and the Shepherds the left. In the little baptistery window in the tower the group illustrates the text, "Suffer little children to come unto me."

*Handsworth.*—The new Swedenborgian church of Handsworth contains several memorial windows, one an east window, about 15 ft. by 20 ft., of which the principal subject is the Transfiguration. There is a window of similar proportions at the west end, containing the following subjects:—The Lord blessing little children, John the Baptist exhorting to repentance, Christ at the door, and Mary's choice, with the emblems of the four Evangelists, the lilies of the field, the bread of life, and the victors' crown and palms in separate quatrefoils. Four of the eight windows in the aisles contain either figures or floriated subjects, and the eighteen clearstory windows, which are of stained glass, have been executed by Messrs. Camm Brothers, of Smethwick.

## Miscellaneous.

*A Railway Station for Northumberland Avenue.*—At the meeting of the Metropolitan Board of Works, on the 22nd inst., a report was presented from the Works Committee on the subject of the proposal of the Metropolitan District Railway Company for an exchange of land at Charing-cross, with a view to the erection of a new station, the plans and elevation of which the company would submit for the approval of the Board prior to the works being commenced. The report stated that the architect had prepared four plans, showing the varied proposals made by the company, and he had also presented a report, as directed by the committee, upon the question of value. The company wished to acquire certain land, which had an area of 3,250 ft., fronting on the Northumberland Avenue east, and also the land adjoining the pillars on both sides of the station, comprising an area of about 5,100 ft. In exchange for this the company propose to cede to the Board the approach over the railway in continuation of Villiers-street, 50 ft. wide, giving a direct access to the Embankment. The committee recommended that, subject to stipulations to the effect that the Board should not be required to covenant for title, and that advertisements or placards be exhibited on the exterior of the station unless with the consent of the Board, the proposed exchange be agreed to. The recommendation was adopted.

*A New Street-cleansing Machine.*—There has been made in Bristol of a new machine, designed for sweeping and carting the street mud, which is the invention of Mr. George Colvin, engineer to the Bristol General-Hospital. The spot selected for the trial was a portion of Newfoundland-road and Newfoundland-street, being partially pitched and partially macadamised. It offered the opportunity of testing the capabilities of the invention on either description of road. The trial was witnessed by the city engineer, Mr. Ashmead, Mr. Mark Whitwill, and several gentlemen interested in municipal matters. The machine, which is triangular in form, is so constructed as to be readily attached to an ordinary mud-cart. It consists of two revolving brushes of similar dimensions, surmounted by an iron casing. These brushes sweep up dirt up an incline and into a gutter, which is placed crosswise of the machine. The dirt, as it enters this gutter, is carried from right to left by a series of scrapers or elevators attached to an endless chain, almost similar in construction to the elevators used in the mud carts. These elevators having drawn all the mud to the extremity of the gutter, force it up a shoot 4 ft. in height, and the top of which overhangs the mud cart, into which the matter falls, the elevators pass down the opposite shoot and recommence their services.

Professor Sidney Colvin lately delivered a lecture at Ipswich in connexion with the Art-Union. His subject was "Art in Greece, Art in Tuscany, and Art in Suffolk."